-DRAFT-

GOODS MOVEMENT ACTION PLAN

PHASE I: FOUNDATIONS

Note:

This Phase I draft report of the Goods Movement Action Plan does not include prioritized infrastructure project recommendations or prioritized environmental mitigation strategies. It is a foundational document that details key California goods movement issues, including: projections of future growth, characterization of environmental impacts, an unprioritized inventory of mitigation strategies, characterization of transportation corridors, an unprioritized inventory of pending and proposed infrastructure projects, and a discussion of key public safety and homeland security issues.

After receiving public comment and review by the Cabinet Level Goods Movement Working Group, a Phase II Goods Movement Action Plan will be released with prioritized infrastructure project recommendations and prioritized environmental mitigation strategies.

This document is a work in progress and is not an official position of the Business, Transportation and Housing Agency, the California Environmental Protection Agency, or the Administration. This document is being released to obtain input and comments from all interested stakeholders.

Prepared by

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and
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D R A F T

GOODS MOVEMENT ACTION PLAN

PHASE I: FOUNDATIONS

TABLE OF CONTENTS

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January 27, 2005

GOODS MOVEMENT IN CALIFORNIA

Improving the movement of goods in California is among the highest priorities for Governor Schwarzenegger. The State's economy and quality of life depend upon the efficient, safe delivery of goods to and from our ports and borders. At the same time, the environmental impacts from goods movement activities must be reduced to ensure protection of public health.

The goods movement and logistics industry is an increasingly important sector of good jobs for Californians. It is vital to grow the industry by improving the essential infrastructure needed to move goods from California's ports throughout California and to the rest of the country with a focus on the entire "coast to border" system of facilities, including seaports, airports, railways, dedicated truck lanes, logistics centers, and border crossings. This system of facilities is critical to the national goods movement network and must be the focus of a partnership with the federal government. Improving the goods movement infrastructure also is pivotal to relieving congestion on freeways and increasing mobility for everyone in California. Further, it is vital that local, state and federal authorities cooperate to ensure port, rail and road safety and security.

It is the policy of this Administration to improve and expand California's goods movement industry and infrastructure, in a manner which will:

- Generate jobs
- Increase mobility and relieve traffic congestion
- Improve air quality and protect public health
- Enhance public and port safety
- Improve California's quality of life

The Schwarzenegger Administration has established a Cabinet Working Group to lead the implementation of this policy for goods movement and ports by working collaboratively with the logistics industry, local and regional governments, neighboring communities, business, labor, environmental groups and other interested stakeholders to achieve shared goals.

GOODS MOVEMENT IN CALIFORNIA
EXECUTIVE SUMMARY

In January 2005, the Schwarzenegger Administration developed a policy position on California's goods movement industry that states:

> It is the policy of this Administration to improve and expand California's goods movement industry and infrastructure in a manner which will:
>
> - Generate jobs.
> - Increase mobility and relieve traffic congestion.
> - Improve air quality and protect public health.
> - Enhance public and port safety.
> - Improve California's quality of life.

California's goods movement industry is one of the biggest economic engines within the State. The industry supports one out of seven California jobs, contributes more than $200 billion per year to the State's economy, and produces more than $16 billion in tax revenues to state and local government.

As large as the goods movement industry is, global trends are converging to create opportunities for substantial growth over the next two decades. Shipments of containers are poised to double over the next 15 years and, perhaps, triple over the next 20 years. To meet this challenge, California's ports have engaged in decades-long expansion programs to accommodate larger ships and improve dockside facilities to load and unload the ships. However, by the mid-1980s, it became apparent that constraints to throughput capability in the future would increasingly come from infrastructure limits *outside* the ports.

In accommodating prospects, most infrastructure initiatives have been focused on reducing congestion on and adding capacity to the rail and highway elements of the State's four "port-to-border" goods movement corridors. However, in addition to physical capacity constraints, attention must be paid to mitigate the severe environmental and community impacts that affect residents living and working near the ports and goods movement corridors. Emissions from engine exhausts of ships, trucks, and trains have deteriorated air quality and are taking a toll on public health. Solutions must be implemented that improve existing conditions and accommodate future growth.

Finally, addressing homeland security and public safety issues requires careful assessment and aggressive action. The challenge is finding the means to identify and reduce risks without impeding the flow of goods. Continuing close cooperation with local, State, and federal public safety agencies will be essential in addressing these challenges.

Although many of these issues are already being addressed through local and regional efforts, State leadership can help stimulate an appropriate sense of urgency for more

immediate action. The Goods Movement Action Plan will be the vehicle to advance this critical agenda at a pace faster than an otherwise "business-as-usual" approach could achieve. By evaluating proposed infrastructure projects and environmental mitigation strategies from the perspective set forth in the Administration's goods movement policy, the most effective projects and strategies stand a greater probability of being delivered sooner rather than later. The following elements will help guide the effort:

- Consider all goods movement infrastructure and related operations throughout the State as part of one integrated, multi-modal system regardless of funding or ownership (i.e., public, private, or mixed public-private).
- Advance projects with the highest rates of return.
- Recognize project benefits within, between, and among goods movement corridors that are otherwise ignored or undervalued.
- Acknowledge environmental impacts and identify needed resources and strategies to help mitigate those impacts.
- Secure statewide consensus on projects when pursuing federal funding and support.
- Instill a sense of urgency to accelerate project delivery and environmental protection.
- Spur private sector investment and public-private partnerships to leverage public investment.
- Provide a higher-level forum to engage cooperation outside the State's jurisdiction.
- Expand awareness of the importance of the goods movement industry to all Californians.
- Seek opportunities to promote synergies with other statewide policy indicatives.

The Goods Movement Action Plan is a two-phase process. This draft document represents the Phase I report. It is an attempt to synthesize the oral comments and written testimony received at the various "listening sessions" throughout the State to characterize: (1) the goods movement industry and its growth potential; (2) the four port-to-border transportation corridors that constitute the State's goods movement backbone and the associated inventory of infrastructure projects planned or underway; (3) the extent of environmental and community impacts—as well as possible mitigation alternatives; and (4) key aspects of public safety and homeland security issues.

The inventory of infrastructure projects compiled during this Phase I includes approximately $4.0 billion of improvement projects underway and $38.7 billion of planned or proposed projects—for a total $42.7 billion in infrastructure projects. The cumulative cost of air emission related mitigation is estimated at between $2.0 billion and $4.0 billion. The cost of other community impacts mitigation has not yet been quantified. While prospective public safety and homeland security measures have been identified, their cost is not yet available.

This document will be reviewed and made available for public comment to assure that the elements listed above are characterized correctly, that the inventory of proposed projects and proposed mitigation concepts is comprehensive, and that public safety and homeland security issues are fully explored without jeopardizing confidential plans or information.

In this phase, the inventory of pending and proposed infrastructure projects is unprioritized. Also, the environmental mitigation strategies presented have not been prioritized. After receiving public comment and review by the Cabinet Level Goods Movement Working Group, prioritized sets of proposed infrastructure projects, prioritized lists of environmental mitigation strategies, and prospective funding vehicles will be identified in the Phase II effort.

I. INTRODUCTION

Goods movement—the transport of commodities and merchandise—underpins California's entire economy as a primary function upon which all other industries within the State and the State's 35 million residents depend. However, it is more than just that. The State's strategic Pacific Rim location has enabled California to emerge as the entrepôt for the nation—the primary point of arrival and departure for goods entering and leaving the country.[1]

As a consequence of its intrastate and national roles, California's goods movement industry is one of the biggest economic engines within the State. The industry supports one out of seven California jobs, contributes more than $200 billion per year to the State's economy, and produces more than $16 billion in tax revenues to State and local government.[2]

In addition, the size of California's goods movement industry fosters the creation of a high concentration of specialty goods movement firms in areas ranging from logistics, insurance, and banking. The sophisticated services provided by these companies enable businesses in industries such as apparel, agriculture, and high tech to reach vendors, suppliers, and customers on a worldwide basis with a speed and costs that are difficult to achieve from other U.S. locations. Such California-based capability provides a source of comparative advantage to retain and attract businesses in and to the State.

As large as the goods movement industry is, global trends are converging to create opportunities for substantial growth over the next two decades. Shipments of containers are poised to double over the next 15 years and, perhaps, triple over the next 20 years.[3]

Thus far, the complex and sophisticated "supply chains" that have developed to move goods to and from the ports by train and truck have managed to keep pace with the phenomenal growth in goods movement traffic triggered by the introduction of containerized cargo in 1958. Until the mid-1980s, the primary limiter on "throughput," the capacity to move goods to and from the ports by train and truck, was the ports themselves.

To meet this challenge, California's ports have engaged in decades-long expansion programs to accommodate larger vessels and improve dockside facilities to load and unload the ships. However, by the mid-1980s, it became apparent that constraints to throughput capability in the future would increasingly come from infrastructure limits *outside* the ports. The constant streams of trucks and trains were literally dividing communities. Emissions from ships and port operations coupled with growing congestion outside port gates compounded air quality problems and public health concerns.

The Alameda Corridor, a $2.4 billion freight rail expressway between the neighboring Ports of Los Angeles and Long Beach and the rail yards near downtown Los Angeles, was one of the first infrastructure projects in the country specifically built to address congestion outside

[1] Los Angeles Economic Development Corp., "International Trade: Trends and Impacts," May 2004.
[2] Southern California Association of Governments, "Southern California Regional Goods Movement: A Plan for Action," March 2005.
[3] Ibid.

the ports. Completed in 2002, the Alameda Corridor has spawned related projects aimed at de-bottlenecking transportation corridors through dedicated, grade-separated lines.[4]

While the ports continue modernization programs to upgrade their facilities, the statewide inventory of goods movement projects compiled for this report shows that more than 80 percent of the $41 billion planned or programmed for goods movement projects is targeted for improvements outside the ports.[5]

The shift in focus from inside the ports to outside the ports has critical implications for the involvement of the State in the goods movement supply chain. Because California has four "port-to-border" goods movement transportation corridors,[6] the State's overall goods movement "system capacity" will be influenced by the priorities assigned to goods movement transportation project alternatives in competition for federal funds and other resources provided by the State. In addition, the relative priority assigned between goods movement transportation projects as opposed to other transportation projects will also be a factor.

The State also has an increased role in two other dimensions of goods movement operations: environmental mitigation and safety and homeland security. While local authorities are involved in efforts to reduce air emissions, the California Air Resources Board has jurisdiction relative to some mobile sources involved in port operations and other goods movement activities. Even though it does not have jurisdiction over emissions from ocean going ships, the State can help influence carriers to modify their operations to lessen emissions when operating at or near ports.

Relative to safety and homeland security, the State also has an interest in making sure that the efforts of all public safety agencies statewide involved in goods movement-related safety and homeland security are well coordinated. Coordinating statewide efforts with federal homeland security goods movement-initiatives is likely to be more successful than if pursued on a local or regional basis. Examples of such statewide coordination include: securing California's fair share of federal homeland security funding and equitably distributing customs revenues, maintaining adequate levels of staffing of critical federal homeland security personnel assigned to California goods movement operations, and encouraging the federal government to expand efforts to secure containers at their point of origin in foreign countries.

[4] Most notable is the $910 million Alameda Corridor East project that would extend the Alameda Corridor 35 miles east to Pomona on the eastern border of Los Angeles County. The project is part of the $3.0 billion Alameda Corridor East Plan which would provide 125 grade separations and grade crossing improvements within Los Angeles County, Orange County, San Bernardino County, and Riverside County.

[5] See tables in Chapter V. Estimates for port-related emission reduction projects were unavailable and not included.

[6] The four "port-to-border" transportation corridors are Los Angeles/Inland Empire, Bay Area, San Diego/Border, and Central Valley. See Chapter V for descriptions.

II. PURPOSE OF THE GOODS MOVEMENT ACTION PLAN

In January 2005, a Schwarzenegger Administration policy position was prepared that outlines the policy of the Administration on goods movement in California.[7] The policy states that:

> It is the policy of this Administration to improve and expand California's goods movement industry and infrastructure, in a manner, which will:
>
> - Generate jobs.
> - Increase mobility and relieve traffic congestion.
> - Improve air quality and protect public health.
> - Enhance public and port safety.
> - Improve California's quality of life.

In response to this policy, an effort was launched to prepare a Goods Movement Action Plan. The action plan is a tool intended to bring focus to goods movement issues on a statewide basis following the tenets of the Administration's goods movement policy position. Its execution will help advance key actions that would be difficult to achieve under "business-as-usual" conditions. The most important of these key actions include:

- Consider all goods movement infrastructure and related operations throughout the State as part of one integrated, multi-modal system regardless of funding or ownership (i.e., public, private, or mixed public-private). Such a perspective leverages existing assets, promotes stability and diversity, and expands customer choices.

- Advance projects with highest rates of return. Because resources are always limited, ranking projects on a statewide basis relative to their contribution to performance improvement of the entire statewide goods movement system helps achieve improvements faster.

- Recognize project benefits within, between, and among goods movement corridors that are otherwise ignored or undervalued. When project merits are evaluated by traditional metrics, the value a project may have to the State at large may not be captured. Primary examples include goods movement projects that can open bottlenecks and increase throughput for an entire transportation corridor or projects that relieve congestion and reduce emissions. Properly identifying benefits helps prioritize projects and secure funding for the projects that can do the most good.

- Acknowledge the environmental impacts and identify needed resources and strategies to help mitigate those impacts. Air quality mitigation must be fully integrated into

[7] Joint Statement of Secretary Sunne Wright McPeak, Secretary of Business, Transportation and Housing and Alan Lloyd, Secretary California Environmental Protection Agency, "Goods Movement in California," January 27, 2005 (see frontispiece).

goods movement system improvements. Significant investment in emission reduction strategies such as fleet modernization, the use of cleaner fuels, and retrofitting trucks, ships and trains with cleaner emission control technologies is necessary in order for California to accommodate the expected growth in goods movement and continue progress in protecting the environment.

- Secure statewide consensus on projects when pursuing federal support. A major factor that causes California to get less than its "fair share" of federal funding is intrastate jockeying for the same pot of federal dollars. Presenting a unified, statewide slate of projects (as most other states do) helps increase the likelihood that the State can approach its fair share allocation.

- Instill a sense of urgency to accelerate project delivery and environmental protection. By their nature, infrastructure projects are long lead-time endeavors that face many obstacles until they are placed in service. Relating the importance of goods movement projects and environmental improvement to the State's economic well-being will help keep projects on schedule and provide motivation for aggressive action to relieve local communities from unfavorable goods movement-related impacts.

- Spur private sector investment and public-private partnerships to leverage public investment. The goods movement system is a complex supply chain of activities and facilities under private, public, and mixed public-private ownership. Gaining consensus on a statewide basis for the major elements necessary to build out the State's goods movement system helps provide the confidence needed by the private sector to determine how best to make private and public-private investments that add value to the system.

- Provide a higher-level forum to engage cooperation outside state jurisdiction. California's goods movement system requires cooperation and support from stakeholders who are not subject to California control. These include adjacent states, the federal government, and foreign carriers. In addition, other stakeholders that operate in the State but have national or global operations (including retailers, railroads, and logistics companies) are critical participants in the process. Operating at the State level with these stakeholders improves the State's overall position as compared to merely allowing each region and locality to vie for attention separately.

- Expand awareness of the importance of the goods movement industry to Californians. Just as the goods movement industry is a critical element of the State's economy, having the support and confidence of the people of California is critical to expanding the infrastructure and mitigating the impacts of the industry's operation. The State can play an important role in the education process and reinforce the efforts of local and regional entities to communicate the needs and benefits of improving the goods movement infrastructure.

- Seek opportunities to promote synergies with other statewide policy initiatives. Active consideration of goods movement issues with statewide initiatives in areas such as housing, land use, agriculture, international trade, economic development, military base re-use, and energy resources promotes good public policy.[8]

[8] Note that goods movement is itself a subset of the Administration's transportation initiative, "GoCalifornia."

III. PROCESS

Much work has been done at local and regional levels to address important issues facing the goods movement industry. In elevating the discussion to a statewide level, the challenge is to preserve the integrity of local and regional processes while finding a means to distill common elements that can benefit from a statewide approach.

Beginning in June 2004, the Schwarzenegger Administration began a concerted effort to assemble goods movement stakeholders to learn about the problems, opportunities, and challenges facing the future of goods movement within the State. The input generated by these meetings resulted in the formation of the Cabinet Level Goods Movement Working Group in December 2004, co-chaired by Secretary Sunne Wright McPeak of the Business, Transportation and Housing Agency (BTH) and Secretary Alan Lloyd of the California Environmental Protection Agency (CalEPA). Their efforts led to the formation of the Administration Goods Movement Policy in January 2005, described above.

Secretaries McPeak and Lloyd then convened a series of "listening sessions" in Los Angeles and Oakland to hear from the full range of stakeholders engaged or impacted by goods movement activities. These "listening sessions" attracted more than 325 participants who offered specific ideas and recommendations to resolve issues associated with the growth of the goods movement industry and the mitigation of its impacts. Summaries of participants' oral comments and submitted written testimony are posted on the BTH and CalEPA websites.[9]

The Goods Movement Action Plan is a two-phase process. This draft document represents the Phase I report. It is an attempt to synthesize the oral comments and written testimony received at the "listening sessions" to characterize: (1) the goods movement industry and its growth potential; (2) the four "port-to-border" transportation corridors that constitute the state's goods movement backbone and the associated inventory of infrastructure projects planned or underway; (3) the extent of environmental and community impacts—as well as possible mitigation alternatives; and (4) key aspects of public safety and homeland security issues.

This document will be reviewed and made available for public comment to assure that the elements described above are characterized correctly, that the inventory of proposed projects and proposed mitigation measures are as complete as possible, and that public safety and homeland security issues are fully explored without jeopardizing confidential plans or information.

Once there is agreement, Phase II will be conducted. In this phase, all stakeholders will be invited to submit comments on the ranking and sequencing of proposed projects. Those comments will be assessed from the perspective of the Administration Goods Movement Policy. Projects consistent with the policy will be evaluated to determine the feasibility of advancing the timeline for completion consistent with funding availability, legal and regulatory constraints, and other factors. The plan will be reviewed by the Cabinet Level Goods Movement Working Group and then forwarded to the Governor for his consideration.

[9] The URL for the Business, Transportation, and Housing Agency website is www.bth.ca.gov and for the California Environmental Protection Agency website is www.calepa.ca.gov.

IV. THE CALIFORNIA GOODS MOVEMENT INDUSTRY AND ITS GROWTH POTENTIAL

A. Introduction

California goods movement industry issues are driven in large measure by both the rise in U.S. demand for foreign imports and the growing California marketplace. However, changes in the supply chain as well as the relative advantages of different regions and seaports competing for international trade are also driving these issues. This Chapter presents a brief overview of these changes, the State's competitors, and the national- and California-specific forecasts of overall freight movement and containerized, international, merchandise trade.

B. Changes Driving Goods Movement Industry Issues

1. Global Supply Chain

In the last 25 years, both California and the United States, driven by rising demand for inexpensive products and a desire to take advantage of lower production costs overseas, have assumed expanded roles in global trade, particularly as importers. The system comprising product request, movement from producer, and delivery to customer is commonly referred to as the "supply chain." This supply chain essentially operates in a circle, influenced heavily by customer demand.

For example, visualize a shirt at a retail store in Chicago. When it is sold, a product request (in the form of a re-stock or production order) for a replacement shirt is electronically generated. This product request is sent to a producer in Shanghai, China. When the product request is filled, the replacement shirt is loaded into a shipping container, trucked to a port of embarkation, and moved to California by ship. Upon arrival here, the container is transferred to a rail carrier and moved to a rail yard in Chicago. Once there, a local trucking firm moves the container to a distribution center where it is unloaded and the replacement shirt is finally delivered to the retail store that originally generated the product request.

Although increasingly dependent on inventory and financial information and management systems, brokers, and customs agents, global trade could not function without its movement network elements, which permit products from far-away places to fill an ever-increasing demand in California and the nation. The more global the supply chain becomes, the greater become the challenges to the State's goods movement transportation system of streets and highways, rail lines and yards, seaports, airports, and border crossings.

2. Emergence of China and Asia

For West-Coast international trade, the emergence of China and other countries of the Asian Pacific Rim as key producers of manufactured goods has affected significantly the

supply chain and, particularly, its goods movement elements. Additional investment is needed in the State's infrastructure to keep pace as more Asian goods on U.S. shelves means more ships at California's ports, more cargo planes in California's airports, more trains on California's railways, and more trucks on California's highways.

China's continued economic growth is also affecting Mexico, California's largest trading partner. The statistics indicate that after more than 15 years of steady economic growth and high employment, Mexico lost a quarter of a million maquiladora[1] jobs in 2001. While there are no reliable statistics on how many of those jobs were lost directly to China, most estimates put the number at around 70 percent. In Tijuana, where maquiladora factories have flourished, both Sony and Philips recently closed factories and moved them to China.[2] The toy industry has been particularly hard hit. In 1989, Mexico had 600 companies manufacturing toys. This number declined to just 47 companies in 2001.[3]

3. WTO and International Trade Agreements

Changes in the rules governing world trade are also affecting the international trade picture. The World Trade Organization (WTO) is the only international organization dealing with the rules of trade among nations. The WTO has nearly 150 member nations, accounting for more than 97 percent of world trade. Approximately 30 other nations have applied and are being considered for membership. At the heart of the WTO are the WTO agreements negotiated and signed by a majority of its member nations. These agreements are the legal ground rules for international commerce. They are compacts, guaranteeing member nations important trade rights. They also bind member governments to maintain their trade policies within agreed upon limits for the benefit of all. Their purpose is to help producers of goods and services, exporters, and importers conduct business. Their goal is to improve the welfare of member nations.

The Agreement on Textiles and Clothing (ATC) and all its restrictions terminated on January 1, 2005. The end of the ten-year ATC termination transition period means that trade in textile and clothing products is no longer subject to quotas outside normal WTO/GATT (General Agreement on Tariffs and Trade) rules but is, instead, now governed by the general rules embodied in the multilateral WTO trading system.

Notwithstanding the termination of ATC, the U.S. textile industry is determined to control Chinese textile and clothing exports. The industry has filed petitions with the U.S. government seeking the imposition of "safeguards," i.e., caps on imports that the United States and other governments may levy on Chinese textile or clothing items if those items are flooding their markets. China agreed to such "safeguards" until 2008 under the terms of its entry into the WTO. Currently, China, Hong Kong and India provide 71 percent of all U.S. clothing imports. In 1994, prior to the beginning of the

[1] Manufacturing and assembly plants located in Mexico, generally either owned by or producing goods for U.S. companies or markets.
[2] Scott Johnson, "Mexico's China Obsession", November 4, 2002, *Newsweek International*.
[3] Ibid.

ATC termination transition period, those same three nations only combined for 29 percent of U.S. clothing imports according to WTO reports. As the "safeguards" expire, higher volumes of textile and clothing imports can be expected through the nation's seaports, including those here in the state.

4. Retail and Manufacturing Consolidation and E-Commerce

Facing increasing challenges to remain competitive, the retail and manufacturing industry is developing new global business and logistics models (focusing on core strengths and utilizing third parties to handle non-core functions) and techniques (investing in technology to streamline operations, developing closer relationships with supply chain partners, and leveraging the Internet to manage purchases, shipments, and sales). Partly as a result, more complex distribution networks have been developed. In search of greater distribution efficiency, inventory deployment and reduction strategies are being implemented and operations are being consolidated into more centralized, automated facilities.

The growth of e-commerce has enabled some of these changes by opening new windows of opportunity for merchandisers to reach a broader customer base. According to the U.S. Department of Commerce, retail e-commerce in the second quarter of 2004 was $15.7 billion, an increase of 23.1 percent over a year earlier. E-commerce has also stimulated the growth of package distribution companies, resulting in increased distribution truck movement on the nation's highways.

5. Distribution System Sophistication

a. Just-in-Time (JIT) Delivery

JIT delivery has been a significant factor in reducing logistics and warehousing costs. Under the JIT concept, sophisticated inventory control systems reduce warehouse inventory to a minimum thereby shortening the time delay between when a product is manufactured and when it is delivered. Thus, the transit of the product becomes part of the warehousing process. Using the transportation infrastructure as rolling warehousing facilities increases congestion and may have safety implications, as truck trips compound to accommodate JIT. Also, in order for JIT to succeed, the transportation infrastructure must be able to deliver reliable trip times to accommodate the tighter timing of shipments between producers and customers.

b. Cargo Consolidation/Deconsolidation (Transloading)

Cargo consolidation and deconsolidation, also known as transloading, has become an increasing important strategy to enhance efficiency. There are at least two factors driving this trend. First, the per-unit cost advantages of full truck or container shipments has led companies to consolidate shipments. Consolidation has been successful also because, as noted above, in response to JIT, the overall number of distribution centers has been reduced. Finally, the transload allows a value-added action (where the product is

modified or combined with something else) to take place prior to shipment. Second, the vast majority of international containerized trade (75 percent in the case of Los Angeles and Long Beach) arrives in 40-foot "international" containers. However, a "domestic" 53 foot container, if not weight-limited, can handle up to 69 percent more product as the result of size and structural differences. This can provide a significant cost advantage for shippers to transload shipments from international to domestic containers. However, both JIT and transloading practices tend to work against rail shipments because of the smaller loads and tighter scheduling in JIT operations and the generally short trips to consolidation/deconsolidation terminals that are made by trucks.

c. Cargo Ship Size and Trends

Much attention has focused in recent months on the staggering number of new container ships on order. More than $26 billion of new container ships were ordered last year, according to shipbroker H. Clarkson's. According to Paris-based shipbroker BRS-Alphaliner, container ship capacity on order as of February 1, 2005 stands at 53 percent of the existing fleet, a historically high figure that includes 174 ships with capacities greater than 7,500 twenty-foot equivalent units (TEUs).[4] The container shipping industry is already moving toward ships of 10,000 TEU capacities, with 12,500 TEU ships possibly being considered by the end of this decade (see Table 1).

Table 1: Key Factors Driving Increased Maximum Vessel Size

Propulsion efficiency, cost and other economies of scale
The ability of container terminals to physically berth such ships
The capacity of terminals to load and discharge such vessels within an acceptable time frame
The capabilities of terminals to deliver and dispatch large consignments of containers
The effectiveness of hinterland linkages
Technical difficulties, *e.g.*, maximum stack height limitations

6. Trade Routes

a. State System

A vast network of highway and rail corridors (see Figures 1 and 2) serves California. Five interstate corridors form the key highway backbone of this system. From north to south, these include Interstates 5, 80, 15, 40 and 10. The primary rail corridors includes the Union Pacific main lines to the Pacific Northwest, the Central Corridor across the Sierra Nevada, the Los Angeles-Salt Lake City line, the "Sunset Route" to Southern Texas (Houston) and the Burlington Northern lines from Los Angeles and the Bay Area through the Central Valley to Chicago.

[4] The TEU is the international standard measure used to describe containers and container ship or terminal capacity. A 20-foot container = 1 TEU; a 40-foot container = 2 TEU. Thus a 7,500 TEU ship could accommodate as many as 3,750 standard 40-foot international containers.

Figure 1: National Truck Flows To/From California

Figure 2: National Rail Freight Flows To/From California

b. Existing and Alternative Paths To U.S. Markets

With record increases in cargo volume creating delays through the ports of Long Beach, Los Angeles, and Oakland, shippers have begun to diversify the ports of entry for their cargos. This diversification includes other West Coast ports as well as East and Gulf Coasts ports, which can be reached by ships going through the Panama and Suez Canals. Thus, instead of offering only the traditional land-bridge service (disembark at a California port and move by rail through California and across country), ocean shippers are beginning to offer all-water services with greater service frequency, speed and reliability. This section explores some of those other port options.

(i) West Coast Alternatives

(a) Seattle, Tacoma, Portland, and Vancouver, B.C.

These seaports continue to receive cargos diverted and re-routed from California. They are responding by expanding their port terminal capacities. Part of their success is that these seaports are all closer to China and the Asian Pacific Rim than any of the California ports and have smaller highway- and rail-access infrastructure issues. From 2002 through 2004 volumes at these seaports rose from a low of 3.5 percent at Seattle to more than 18 percent at Tacoma. The Port of Tacoma recently completed a major terminal expansion project at its Evergreen terminal as well as several dredging and rail improvement projects. Because of its inland location and relatively small local market, the Port of Portland has been losing container services. Yet in January 2005, the Port of Portland announced plans for an $89 million container expansion project that will double its current TEU capacity to 800,000, primarily benefiting its lone container line Hanjin Shipping. Cargo volumes at the Port of Vancouver, British Columbia, have been rising rapidly, resulting in terminal and rail congestion as well as increased security concerns as the port increases its volume of U.S.-bound cargos. Nevertheless, the Port of Vancouver, British Columbia, is working to complete two major container facility expansion projects that will expand TEU capacity to 5 million by the year 2020.

(b) Mexico

Mexico's West Coast ports provide the Midwest with an alternative direct access to Asia (see Figure 3)—but not without limitations. Among the limitations imposed on westbound goods movement from Mexico's West Coast ports are: congestion at the U.S.-Mexico border crossing, duplicate cargo clearances, return of equipment, higher insurance costs, a lack of infrastructure and port services, as well as others. Nevertheless, these ports are actively pursuing business relationships with importers and exporters involved in the Pacific Rim trade, which, if successful, will have a measurable effect on California's competitiveness, albeit tempered by the above-noted limitations.

Manzanillo is the largest container seaport in Mexico and, currently, the only facility on the Pacific Coast of Mexico able to service the largest container vessels. When SSA Global won a 20-year concession in Manzanillo to operate a single berth container

terminal in 1995, the port's productivity improved substantially, increasing Manzanillo's share of Mexico's Pacific Coast container traffic from 51.4 percent in 1995 to more than 90 percent in 2003. Overall port container volume in 2003 was 1.2 million TEUs.

Hutchinson Port Holdings, part of the Hong Kong conglomerate Hutchinson Whampoa, has announced it will invest $1.2 billion in a new deep-water seaport at Punta Colonet, approximately 125 kilometers south of Ensenada. Anticipated port volume in the initial phase is estimated at between 1,000,000 and 1,500,000 TEUs per year. A new rail link, to be built by the Union Pacific, would connect Punta Colonet with the main line U.S. railroads at Eagle Pass, Texas. It is possible that new roadways may also be built linking Punta Colonet with Ensenada and Mexicali/Tecate.

Currently, the Port of Ensenada port receives about 50,000 TEUs per year. Dredging operations that began in December 2004 will allow larger vessels to dock at the port. Hutchinson Port Holdings controls the container port in Ensenada under a 20-year contract, the terms of which prohibit initiation of any new container operations without Hutchinson's express permission.

The other major port on Mexico's Pacific coast is the Port of Lazaro Cardenas. Lazaro Cardenas, which handles about 250,000 containers a year, is served by the Mexican railroad TFM, a party in a joint venture with Kansas City Southern Railroad.

Veracruz, on Mexico's Gulf coast, is Mexico's largest port and the first Mexican port to be privatized in the mid-1990s. It is the primary gateway to Mexico City. It is also a scheduled port for a number of transatlantic services from the Gulf of Mexico, which also call on U.S. Gulf ports like Houston and New Orleans. Veracruz handles more total volume than Manzanillo, but Manzanillo became Mexico's largest container seaport in 2002.

Figure 3: Key Current and Potential Mexican Container Seaports

(ii) Gulf Coast Alternative: Houston

The Port of Houston is a 25-mile-long complex of diversified public and private facilities located just a few hours sailing time from the Gulf of Mexico. The seaport is ranked first in the United States in foreign waterborne commerce, second in total tonnage, and sixth in the world (in large part due to petroleum products). Construction of the Bayport Container and Cruise Terminal is underway. This $1.2 billion project broke ground in early June 2004 and is on course for completion of the first phase in mid-2006. When completed the container expansion portion will bring capacity to 2.1 million TEUs and will add 60 acres to container terminal operations. The Port of Houston is the only Gulf Coast port that currently provides all water service to and from Asia. Wal-Mart, the world's largest retailer, is building a two million-square-foot distribution facility near the Port of Houston to avoid West Coast delays.[5]

[5] Hickey, Kathleen , "Capacity Crunch Will Likely Get Worse Before it Gets Better," *Global Logistics & Supply Chain* (February 2005)

(iii) Panama Canal Expansion

The Panama Canal expansion project has been projected to range in cost from $2 billion to upwards of $12 billion. With a population of three million and an annual gross domestic product (GDP) of approximately $12 billion, even a modest $6 billion expenditure amounts to almost half of Panama's entire GDP. Understandably, some observers have identified the economic feasibility of the project to be one of the most significant obstacles to its implementation. Already burdened by a public debt of more than $9 billion, Panama would find itself in the 10th worst position in the world for debt to GDP ratio if it spent another $8 to $10 billion on the Panama Canal expansion project.

Thus, plans for expansion of the Panama Canal have been scaled back. All indications are, however, that the expansion project will continue moving forward with construction possibly starting in 2005, even though financing remains an issue. Environmental impacts, population displacement, and other issues have also been cited as reasons for a de-scoped alternative plan. For example, an improved railroad tow track, scheduled to be completed in 2004, is still not operational. Other plans include construction of holding pools adjacent to each new lock for water reuse and adding a third canal channel to accommodate container ships carrying up to 10,500 TEUs. The Panama Canal Authority believes it can solve the financing problem through a combination of public investment and toll increases. It cites the fact that in 2003 it was able to raise tolls by 12 percent and still retain market share[6]

(iv) East Coast via Indian Ocean and Suez Canal

For goods moving from Southeast Asia, the Suez Canal route is a viable alternative, with rates being about the same as for shipments transiting the Panama Canal. Most all-water services from Asia, however, use the Panama Canal route because it offers faster transits from China. All-water services to Boston from southern China and Hong Kong take about 29 days, about five days longer than shipping through the West Coast. Shipments from Indonesia and Vietnam move through the Suez Canal and take 33 to 36 days to reach Boston. Key East Coast seaports that have taken advantage of California delays include the Ports of New York/New Jersey, Newport News, Charleston, and Savannah.

C. National Projections

Three different national forecasts of goods movement demand are available for comparison. The first is the Global Insights, Inc. (formerly DRI-WEFA) 2004 Long-Term Economic Forecast.[7] The second is an analysis by the Public Policy Institute of California (PPIC) entitled, *California Global Gateways, Trends and Issues* (2004)[8]—its conclusions are presented in Tables 2 and 3. The third is the forecast released in 2003 by

[6] Website, Global Insights, February 2005.
[7] Global Insights, Inc., United States GDP and Trade Outlook, Fourth Quarter, 2004 (February 2005)
[8] Jon Haveman, David Hummels, California's Global Gateways: Trends and Issues , Public Policy Institute of California, San Francisco, April 2004.

the Federal Highway Administration (FHWA) in its Freight Analysis Framework[9] (see Table 4). Both of these latter forecasts have both dollar value and tonnage projections. Currently, there are no readily available national forecasts of container volumes.

Table 2: Projected Growth in the Value of U.S. and California Trade Through 2020 (in billion dollars)

Exports	Air	Percent Increase over 2002	Vessel	Percent Increase over 2002	Other	Percent Increase over 2002	Total	Percent Increase over 2002	CA Share of U.S. Value
2002									
United States	$223	-	$190	-	$258	-	$671	-	-
California	58	-	39	-	14	-	111	-	16.5%
2010									
United States	384	72%	314	65%	381	48%	1,079	61%	-
California	106	83%	68	74%	22	57%	196	77%	18.2%
2020									
United States	591	165%	500	163%	574	122%	1,665	148%	-
California	167	188%	112	187%	37	164%	316	185%	19.0%

Imports	Air	Percent Increase over 2002	Vessel	Percent Increase over 2002	Other	Percent Increase over 2002	Total	Percent Increase over 2002	CA Share of U.S. Value
2002									
United States	254	-	536	-	325	-	1,115	-	-
California	53	-	196	-	18	-	267	-	23.9%
2010									
United States	306	20%	733	37%	411	26%	1,450	30%	-
California	63	19%	266	36%	25	39%	354	33%	24.4%
2020									
United States	397	56%	1,131	111%	561	73%	2,089	87%	-
California	74	40%	368	88%	39	117%	481	80%	23.0%

Source: PPIC, "California's Global Gateways: Trends and Issues," April 2004

Global Insights is forecasting a 78 percent growth in GDP, a 176 percent growth in U.S. imports, and a 248 percent growth in national exports between 2002 and 2020. According to this forecast, international trade in general and exports in particular should expand at a much faster pace than GDP. The PPIC analysis estimates a much smaller growth in international trade. According to PPIC, U.S. imports will increase by only 87 percent and exports by 148 percent during that same period. An economic analysis was performed by the California Department of Transportation (Caltrans) of the relationship between GDP, imports, and exports and was used to estimate broad future trade

[9] Federal Highway Administration, Freight Analysis Framework, March 2003.

projections. Caltrans' analysis indicates that, on average, a 10 percent growth in GDP would lead to a 1.6 percent increase in exports and a 2.2 percent increase in imports. This analysis concluded that U.S. imports would increase at a faster rate than the rate estimated by PPIC, but exports would increase at a slower rate than estimated by both Global Insights and PPIC.

Table 3: Projected Growth in the Volume of U.S. and California Trade Through 2020 (in billion tons)

Exports	Air	Percent Increase over 2002	Vessel	Percent Increase over 2002	Total	Percent Increase over 2002	CA Share of U.S. Volume
2002							
United States	2.3	-	317.2	-	319.5	-	-
California	0.4	-	35.4	-	35.8	-	11.2%
2010							
United States	3.7	61%	563.2	78%	566.9	77%	-
California	0.7	75%	64.6	82%	65.3	82%	11.5%
2020							
United States	5.8	152%	1,107.40	249%	1,113.20	248%	-
California	1.2	200%	124.7	252%	125.9	252%	11.3%

Imports	Air	Percent Increase over 2002	Vessel	Percent Increase over 2002	Total	Percent Increase over 2002	CA Share of U.S. Volume
2002							
United States	3.5	-	813.3	-	816.8	-	-
California	0.6	-	91.3	-	91.9	-	11.3%
2010							
United States	4.3	23%	1,495.2	84%	1,499.5	84%	-
California	0.8	33%	147.0	61%	147.8	61%	9.9%
2020							
United States	5.5	57%	3,149.7	287%	3,155.2	286%	-
California	1.1	83%	275.6	202%	276.7	201%	8.8%

Source: PPIC, "California's Global Gateways: Trends and Issues," April 2004

FHWA's forecasts have an earlier starting date (1998) and, thus, cover a slightly longer time period. On a national basis, the FHWA estimates the value of international trade would grow 309 percent. On a tonnage basis, however, they predict total volume would grow only 85 percent. PPIC estimates a much higher growth rate, a 248 percent increase in exports and a 286 percent increase in imports. This may be partly explained by the

relative weakness of the FHWA's forecast in addressing non-NAFTA based international trade.

Table 4: FHWA Freight Analysis Framework Value/Tonnage Estimates

		Value (millions of dollars)				Tonnage (millions of tons)	
Factor/Year	**1998**	**2010**	**2020**		**1998**	**2010**	**2020**
United States	$9,312	$18,339	$29,954		15,271	21,376	25,848
Percent Growth	—	49.2	221.7		—	28.6	69.3
California	$1,218	$2,564	$4,315		1,360	1,980	2,435
Percent Growth	—	52.5	254.3		—	31.3	79.0
California Share of U.S.	13.1	14.0	14.4		8.9	9.3	9.4

Source: Federal Highway Administration, Freight Analysis Framework, March 2003

D. Estimating California's Share

1. Accounting for Historical and Emerging Factors

California has historically received the dominant share of Asian, transpacific containerized trade. However, increasing regional congestion around the three major seaports of Los Angeles, Long Beach, and Oakland is changing this position. As discussed above, shippers are diverting and reallocating shipments to other West Coast seaports and/or using all water services to Gulf Coast or East Coast seaports. California land-bridge delays caused by the ports' inability to handle increasing cargo volumes, labor strikes, and natural disasters have prompted shippers to modify logistics practices so that goods are not delayed: some shippers have established warehousing and distribution facilities in close proximity to alternative seaports, ensuring easier access and distribution of their goods throughout the nation. Wal-Mart, for instance, now ships only approximately 43 percent of its goods through Southern California seaports; in 1994 it shipped 71 percent. The balance is shipped through Gulf Coast or East Coast seaports.

Recognizing the possibilities, seaports throughout the Gulf and East Coasts, as well as seaports in the Pacific Northwest, have become very accommodating and opportunistic with regard to shippers, causing California seaports to lose business. In this respect, California seaports will continue to be threatened. Solving the State's infrastructure and capacity problems may lessen that threat.

Nevertheless, international trade activity in the Los Angeles Customs District was projected to reach new record levels in 2004. The value of two-way trade at the Los Angeles Customs District was projected to increase by 11.6 percent to $262.3 billion, according to the Los Angeles Economic Development Corporation. Similarly,

international two-way trade activity in the San Francisco Customs District through August 2004 was already $80.8 billion—greater than the $79.6 billion in international two-way trade in the San Francisco Customs District for all of 2003.

2. Separating In-State and National Demand

California seaports handle a significant share of U.S. containerized trade. In 2003, based on statistics provided by the American Association of Port Authorities and the Pacific Maritime Association, California seaports handled 43.4 percent of the nation's container volume. This share is expected to drop, however, as shippers and shipping lines diversify to other ports of entry. Of this volume, 50 to 70 percent of Southern California container traffic went to regions outside California, whereas only 20 to 30 percent of Oakland's container traffic went to regions outside of California.

3. Estimates of Total California International Trade and Container Movement Demand

According to PPIC, between 2002 and 2020, the dollar value of imports through California is predicted to increase 80 percent; the dollar value of exports 187 percent.[10] By tonnage, however, imports are projected to increase 201 percent and exports 252 percent, reflecting what PPIC believes will be an increase in lower cost, heavier weight commodities moving through California as international trade. FHWA forecasts a much greater increase (352 percent) in the dollar value of international imports transiting California for the period 1998 to 2020. By tonnage, however, FHWA projects only a 153 percent increase in imports in the same period. Importantly, the FHWA analysis includes projections for overall freight movement, both international and domestic. Overall freight movement through California between 1998 and 2020 is projected to grow 254 percent (by dollar value) and 79 percent (by tonnage).

A Caltrans analysis utilizing California personal income to derive its estimates projected an almost identical growth rate for exports (187 percent), but a much higher growth rate (191 percent) for imports than the PPIC analysis. This discrepancy might be partly due to the fact that the Caltrans analysis (based as it was on California personal income) excludes imports that pass through California to other states. It should also be noted that the Caltrans analysis seems to suggest that the growth in international trade can be better explained by the growth in personal income than by the growth in population: during the period examined by the Caltrans analysis (1970 to 2003), the state's population grew by only 80 percent, whereas real personal income grew by 238 percent; during that period, imports grew by 1,098 percent whereas exports only by 535 percent, in constant dollars.

California seaport container volumes (actuals for 1995 and 2000 and projections for 2005, 2010, and 2020) are set forth in Table 5 and in the accompanying bar graph. Between 1995 and 2000 there was a steady increase in container volume. The total number of TEUs for the three major ports (Los Angeles, Long Beach, and Oakland) combined increased by 4.5 million TEUs. The ports project container volumes to

[10] On a modal basis, the maritime numbers are 88 percent and 187 percent, respectively, and the air cargo numbers 40 percent and 188 percent, respectively.

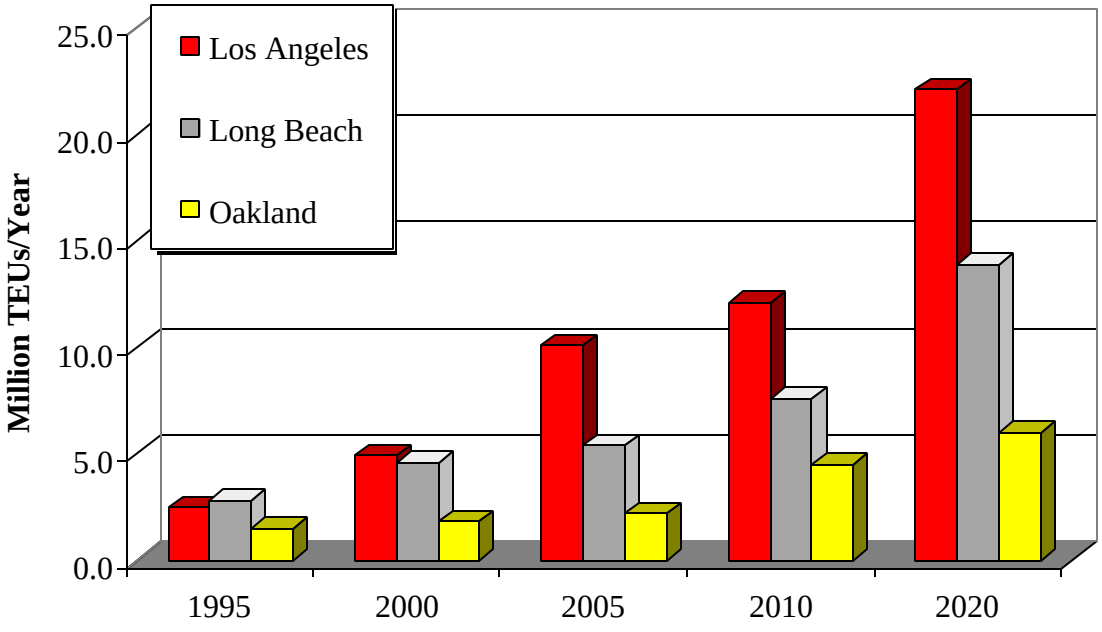
increase another 6.4 million TEUs to 17.7 million between 2000 and 2005. Reinforcing the accuracy of these projections is that actual container volume in 2004 was 13.1 million TEUs at Los Angeles/Long Beach and 2.0 million TEUs at Oakland, for a total of 15.1 million TEUs. TEU volumes for the period 2005-2010 are projected to continue to increase, although not as dramatically as during the previous five-year span—but still amounting to an increase of 6.5 million TEUs (a 37 percent increase). Long term (2005 to 2020) container volume is projected to increase 24.3 million TEUs—137 percent in that 15-year period. If the projections prove to be accurate, combined container volumes for the three California seaports between 1995 and 2020 would increase by 35.2 million TEUs—a 518 percent increase in the 25-year span shown in the table.

Table 5: California Port Container Volumes

Port	TEUs (millions)					Percentage (%) Increase		
	1995	2000	2005	2010	2020	2000-2005	2005-2010	2005-2020
Los Angeles	2.5	4.9	10.1	12.1	22.1	106.1	19.8	118.8
Long Beach	2.8	4.6	5.4	7.6	13.9	17.4	40.7	157.4
Oakland	1.5	1.8	2.2	4.5	6.0	22.2	104.5	172.7
Totals	**6.8**	**11.3**	**17.7**	**24.2**	**42.0**	**56.6**	**36.7**	**137.3**

[NEED TO REFERENCE SOURCE]

California Port Container Volumes



[NEED TO REFERENCE SOURCE]

4. Distinction Between Demand and Actual Throughput Capability

Most of the forecasts issued by the ports are unconstrained, i.e., not limited by port terminal capacity, landside access, or environmental considerations, making it difficult to determine actual throughput capabilities. However, one such analysis estimates the actual existing throughput capacity of the Ports of Los Angeles and Long Beach to be between 28 and 30 million TEUs—slightly more than double the 2004 volume of 13.1 million TEUs. While that capacity estimate assumes no new landfill, it does assume: some minimal development of vacant land; minor redevelopment of several terminals; 24/7 operations; increased container stacking and stack heights; reduced container dwell time; upgraded information systems to assign, track, and stage containers; and enhanced on-dock rail operations. Even with the above-cited port enhancements and other transportation-element improvements, such as reduced empty container-truck trips, highway and rail infrastructure improvements will still need to be made. A recent unrelated analysis by the Ports of Los Angeles and Long Beach and the Alameda Corridor Transportation Authority shows that proposed improvements for the Interstate 710 corridor (which include both additional general purpose lanes and dedicated truck lanes) will still be required despite extended port hours and other improvements in goods movement efficiency.

E. Opportunity Cost to California/U.S. as a Consequence of Congestion and Capacity Limitations

California is already beginning to experience the effects of the opportunity cost of increasing congestion, inadequate infrastructure, limited access, and health concerns in and around California's major seaports. California is not, however, alone. All states with large seaport facilities are experiencing similar issues related to access, infrastructure, the environmental, and channel depths. It is becoming increasingly clear that even if seaports had all of the capacity they wanted, the landside infrastructure in California and the rest of the nation is simply not adequate to keep up with rising container and freight volumes. Rail capacity is also becoming more constrained and there is a national shortage of truck drivers. The consequences of these capacity limitations are that shippers will continue to seek the path of least resistance to reach their customers. Because their markets lie in large population centers, that is where their goods must go. With the United States being the primary consumer market destination for Asian goods, shippers will continue to optimize their supply chains in an effort to work around congestion and capacity limitations. Effective solutions can be developed and opportunity loss minimized only through governmental action in conjunction with the goods movement industry's shipper, receiver, carrier, and other stakeholders.

V. CHARACTERIZATION OF CALIFORNIA'S "PORT TO BORDER" GOODS MOVEMENT CORRIDORS AND PROJECT INVENTORY

A. Overview of California's Four Goods Movement Regions

A complex network of highways, rail lines, seaports, airports, and border crossings, which link the primary gateway regions to each other and to the rest of the nation, form California's goods movement system. The map of California on the following page illustrates the priority regions and corridors of this system.

As originally described in the 2002 Global Gateways Development Program (and updated for this report), the system includes four gateway regions: Los Angeles/Inland Empire, Bay Area, San Diego/Border, and the Central Valley. In addition, this Chapter also addresses the goods movement needs in other areas of the State as described in the State Gateways/Central Coast discussion.

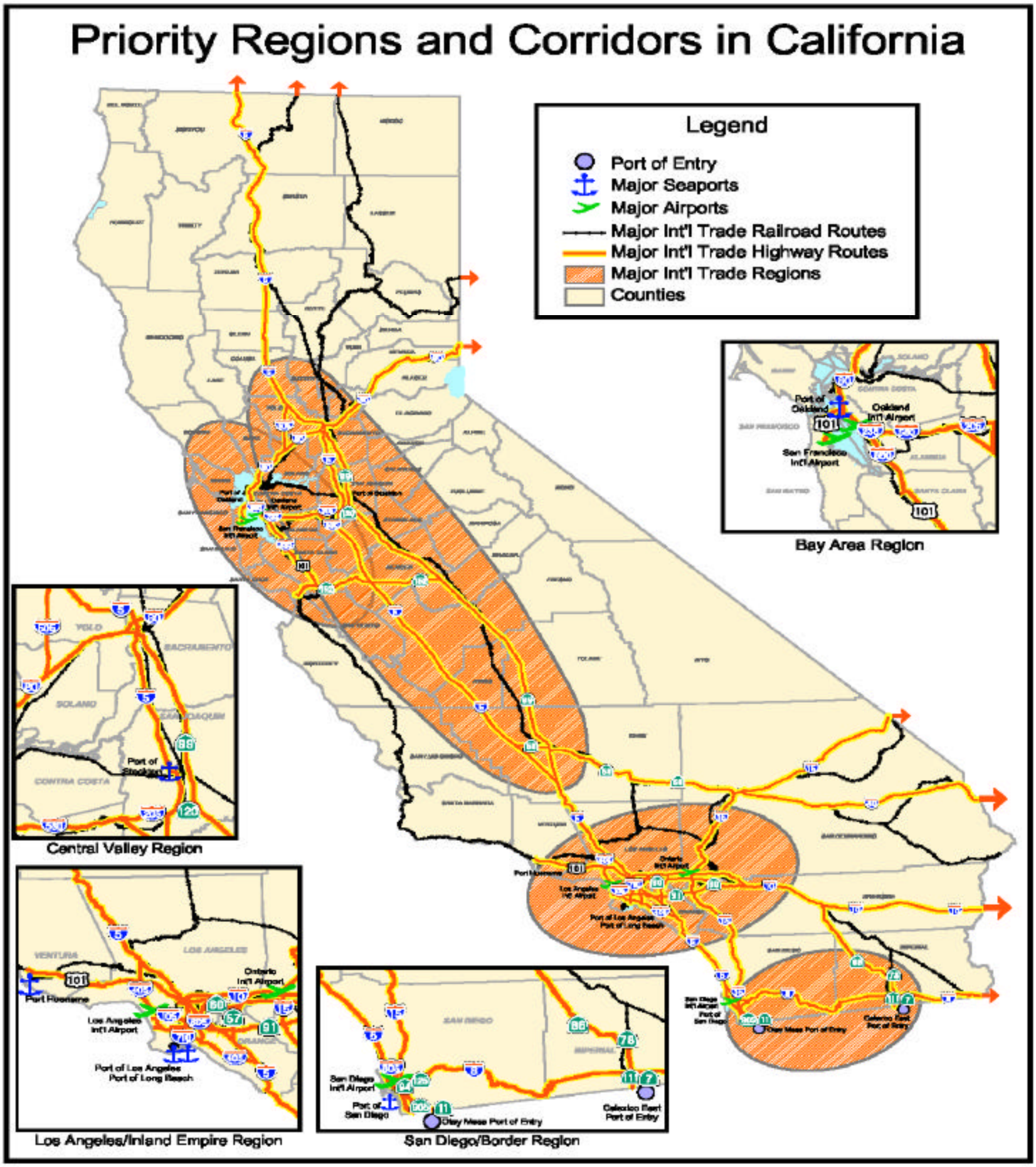
Among California's top priority global gateways are six ports (Los Angeles, Long Beach, Oakland, San Diego, Hueneme, and Stockton), five international airports (Los Angeles, Oakland, San Francisco, Ontario, and San Diego), and two border crossings (Otay Mesa and Calexico East). Key international trade corridors include twelve interstate highways[1] and substantial portions of five other interstate highways,[2] five U.S./State Routes[3] and sections of twelve others,[4] as well as the main rail corridors of the Burlington Northern Santa Fe and Union Pacific railroads. These transportation corridors support the key gateways in the origin and receipt of international and domestic trade.

Congestion and decreased reliability of travel times on California's highways are creating major challenges for shippers, truck drivers and commuters alike. Both Burlington Northern and Union Pacific face mainline and yard capacity constraints as they struggle to handle increases in freight and passenger train volumes. For the State's seaports, truck congestion and delay present the most serious landside transportation problems and all three major container ports are seeking to expand rail shipments in response. For the international airports, truck access is a critical problem, especially at Los Angeles, Oakland, and Ontario airports. San Diego airport also has operating constraints as well as runway and land-use limitations.

1. Los Angeles/Inland Empire Region

The Los Angeles/Inland Empire Region (Los Angeles, Orange, Riverside, San Bernardino, and Ventura Counties) is the nation's largest international trade attractor and consumer, rivaled only by the New York City/tri-state area. In the area covered by the Southern California Association of Governments (SCAG), there are more than 17 million

[1] Interstates 5, 15, 40, 80, 105, 110, 205, 238, 405, 505, 805, and 880.
[2] Interstates 8, 10, 580, 605, and 710.
[3] U.S. or State Routes 11, 57, 60, 91, and 905.
[4] U.S. or State Routes 7, 50, 58, 78, 86, 94, 99, 101, 111, 120, 125, and 152.


Priority Regions and Corridors in California
Legend
Port of Entry
Major Seaports
Major Airports
Major Int'l Trade Railroad Routes
Major Int'l Trade Highway Routes
Major Int'l Trade Regions
Counties
Bay Area Region
Central Valley Region
Los Angeles/Inland Empire Region
San Diego/Border Region

people with more than 6.9 million jobs, approximately 550,000 of which are directly related to handling goods through the region (including Imperial County). Thirty-seven percent of all U.S. containerized international trade moves through the region's seaports.

Southern California experiences the greatest impacts in the State of increased goods movement. According to SCAG's February 2005 report, *Southern California Regional Strategy for Goods Movement: A Plan for Action,* ensuring that goods movement activities continue to flourish will be a region-wide challenge. The report stated:

> ". . . the Fall 2004 slowdown at San Pedro Bay ports (due to a labor shortage) slowed the offloading of goods arriving for the holiday shopping season. Intermodal yards in Los Angeles and San Bernardino counties have nearly reached capacity to transfer containers from trucks to rail—and freight volumes are expected to at least double in the next two decades."

The report observes that public and private stakeholders are doing everything they can to address these issues, including $800 million in port improvements and State highway projects that will facilitate goods movement, but significantly more investments are needed.

2. Bay Area Region

The metropolitan area that surrounds San Francisco Bay in Northern California contains an estimated population of 7.1 million people and 2.1 million jobs. By 2030, these figures are projected to increase to 8.7 million and 2.9 million, according to the Association of Bay Area Governments.[5] The region is defined by nine counties that border either San Francisco Bay or San Pablo Bay: Alameda, Contra Costa, Marin, Napa, San Francisco, San Mateo, Santa Clara, Solano, and Sonoma. Manufacturing, freight transportation, and warehouse and distribution businesses account for more than 37 percent of Bay Area economic output. Collectively, these businesses spend approximately $6.6 billion annually on transportation services.

3. San Diego/Border Region

The San Diego/Border Region is made up of two California counties (San Diego and Imperial), which interact with five Baja California municipalities (Tijuana, Playas de Rosarito, Ensenada, Tecate and Mexicali) along their joint 150-mile border. Together, San Diego and Imperial County have a population of 3.2 million people and an employment base of approximately 1.0 million jobs.

Since the passage of the North American Free Trade Agreement (NAFTA), trade across the California/Mexico border increased steadily in the 1990s with Mexico surpassing Japan to become California's top export trade market in 1999. Total California exports into Mexico exceeded $12.5 billion in 2003. Total trade activity through the

[5] Association of Bay Area Governments testimony provided at the Goods Movement and Ports Hearing, Oakland, February 11, 2005.

California/Mexico ports of entry exceeded $29.5 billion in 2003. It is estimated that trucks transport approximately 98 percent of this trade.

The growth in trade is in part due to the development of the maquiladora industry manufacturing/assembly plant operations along the California/Baja California border. Although some twin-plant operations have relocated to the Pacific Rim, the majority of the remaining 893 maquiladoras located within the municipalities of Tijuana, Tecate and Mexicali are producing goods of higher value, such as electronics, computers, and automobiles and their components.

Imperial County's agriculture production ranks eleventh in the State producing over $1 billion in goods annually. Several of these agricultural commodities, including Sudan grass, are exported from this region to Asia via the Ports of Los Angeles and Long Beach.

4. Central Valley Region

According to the Demographic Research Unit of the California Department of Finance, the Central Valley Region has eight of the ten fastest growing counties in California and provides half of all fruits and vegetables to America. The region is also seeing significant growth of warehousing and distribution facilities that have moved from the Los Angeles and Bay Area regions. The rapid developmental growth and continued extensive agricultural production creates conflicts between passenger and freight movement, particularly along access arteries into the Bay Area region and through the transportation system crossroads of Sacramento. The primary routes to and through the Central Valley Region are Interstates 5, 80, 205, and 505, State Routes 46, 58, 99, 152, and 190, and the main lines of the Burlington Northern and Union Pacific railroads.

5. State Gateways and Central Coast

The State's Northern Gateways, Nevada Gateway, and the Central Coast are critical links in the State's goods movement system, yet their importance can be overlooked when considered against goods movement needs in more urban areas.

The Northern and Nevada Gateways, which include Districts 1, 2 and 9 of the California Department of Transportation (Caltrans), have a combined population of approximately 565,000. The primary goods movement corridors for the Northern and Nevada Gateway regions are Interstate 5 and U.S. Routes 101 and 395. State Route 299 (from Redding to Eureka) and U.S. Route 199 (from north of Crescent City to the Oregon border) are also important east-west connectors that link these major corridors. The Central Coast region (which includes all of Caltrans District 5) has a total population of 1,379,000. The primary goods movement corridors for this region are U.S. Route 101 and State Routes 46 and 152.

The majority of jobs in all these regions are in the service sector, retail, recreation, and government. Resource-based jobs are declining in the Northern Gateways; however, agriculture remains important in the Central Coast (although more and more formerly agricultural land is being converted to other uses).

B. Infrastructure Project Context and Identification

The following sections identify by region California's **major** goods movement projects, including improvements that are underway (i.e., that will be completed in the next three years) as well as additional improvements that are necessary—both those already programmed and those that are planned over the next 20 years. These projects were identified based on the following screening criteria:

1. Major projects, $10 million or greater, that will directly benefit goods movement, including truck movement, rail freight operations, and/or access to or from the State's major seaports, airports, or border crossings.

2. Capacity-increasing projects that cross several categories, such as system monitoring and evaluation, system preservation and maintenance, system operational improvements (including intelligent transportation systems and truck parking/roadside safety rest areas)—all of which are critical components of a successful goods movement system improvement program. Additional actions that address the connection between land use and transportation, the use of value pricing concepts, and modifications to institutional requirements will also be required.

3. Projects previously identified within a Global Gateways Development Program route, having a minimum average daily five-axle truck volume of at least 3,000. Included also are some non-urbanized area projects on major through routes that have less than this critical volume but, nevertheless, are key to interregional truck movement and access and which address key freight movement bottlenecks or concerns.

Finally, please note that this is an order-of-magnitude analysis. In selecting projects to be included, there may be important projects that have been omitted. In some instances sufficient information could not be obtained to include them in the regional list. In other instances, they are still subject to ongoing regional discussions what those projects should be and their relative priority. Environmental mitigation projects are not discussed in this Chapter—see the discussion in Chapter VI.

C. Los Angeles/Inland Empire Region

1. Characterization of Existing "Port-to-Border" Operations

Freight movement within the Los Angeles/Inland Empire Region is highly impacted both by international trade being moved through its seaports and airports and by significant volumes of domestic trade on its transportation network. Key highway system routes include Interstates 5, 10, 15, 110, 605, and 710, and State Routes 57, 60, and 91. Between 50 and 60 percent of all shipments arriving at the region's ports are bound for points beyond the local area and, thus, must cross an already overloaded transportation network to reach their ultimate destination—at least initially by truck. These routes continue east through the Inland Empire and north and south of the Los Angeles basin. From San Bernardino traffic moves north and east on Interstate 15 to Nevada and on Interstates 10 and 40 to Arizona.

The Ports of Los Angeles and Long Beach depend on this local highway network. These two ports combined currently generate over 40,000 truck trips per day. By 2010, this volume could exceed 50,000 truck trips per day, and reach 92,000 by 2020. The most heavily impacted route of this access network is Interstate 710 (Long Beach Freeway); one report claims that 15 percent of all containers arriving in the United States travel on this freeway. This corridor has the highest truck accident rate in the State. The Port of Hueneme in Ventura County also serves the region.

The ports and the region are served by two Class I railroads, Burlington Northern and Union Pacific. Both railroads are experiencing congestion along their systems, as Amtrak intercity passenger rail, Metrolink commuter passenger rail, and rail freight train volumes continue to climb. The Burlington Northern yards are particularly impacted, as both their main inter-modal yards in East Los Angeles and San Bernardino are currently operating at above original design capacity.

The 20 mile-long Alameda Corridor, which links the Ports of Los Angeles and Long Beach to the transcontinental rail yards in downtown Los Angeles, improved rail access to the ports. It cut the transit time between the ports and rail yards in half, eliminated rail/highway conflicts at 200 at-grade rail crossings, and resulted in slashed emissions from idling cars, trucks, and locomotives. But its full potential cannot be realized until additional main line and yard capacity is developed and selected grade separations of the Alameda Corridor East are completed. The principal user of the Alameda Corridor is international cargo bound for or originating from markets outside of California—accounting for approximately half of all cargo handled by the Ports of Los Angeles and Long Beach.

The region is also served by the first and fourth largest (by volume) air-cargo airports in the State, Los Angeles International and Ontario Airports. With Los Angeles International Airport congestion increasing, due to rising passenger volumes and restricted ground access, efforts are underway both to expand air cargo operations at Ontario Airport and, possibly, to develop air cargo operations at one or more of the deactivated U.S. Air Force bases in the Inland Empire, including the Southern California Logistics Airport (formerly George AFB), San Bernardino International Airport (formerly Norton AFB), and/or March Air Force Reserve Field (formerly March AFB).

2. Current vs. Future Estimates of Traffic

Caltrans projects annual truck vehicle miles of travel to grow in the Los Angeles/Inland Empire Region (including Imperial County in this case) from 6,676 billion miles to 10,403 billion miles, an increase of 64 percent, between 2005 and 2025. Average daily freight train volumes were 112 trains per day in 2000 and are projected to increase to 165 by 2010. By the year 2025, freight train volumes are projected to more than double to 250 trains per day.[6]

[6] Southern California Association of Governments, "LA – Inland Empire Railroad Mainline Advanced Planning Study," 2002.

3. Improvements Underway

County/ Route	Project Title/Description	Cost (in millions)	Estimated Completion Date	Primary Impact
LA 5	Santa Clarita-Hasley Canyon and I-5, reconfigure existing interchange	19	Jun 07	Improves operations
LA 5	I-10/US-101 junction to Providentia Ave., rehabilitate roadway (long-life pavement)	55	2007	Rehabilitates facility
SBD 10	Eastbound truck climbing lane/auxiliary lane (Redlands and Yucaipa)	18	Oct 07	Improves operations
SBD 15	Reconstruct interchange and widen to six lanes in Hesperia at Main St.	14	Oct 05	Improves operations
SBD 15	Add southbound and northbound mixed flow lanes from Victorville to Barstow	123	Jul 05	Increases capacity
SBD 15	Southbound truck climbing lane, roadway and bridge rehabilitation, Barstow/Yermo	34	Jul 07	Improves operations
ORA 22	Add HOV lanes and truck lane from I-5/SR-22 interchange to Beach Blvd.	271	Jul 07	Improves operations
LA 91	In Carson and Long Beach, rehabilitate roadway (long-life pavement)	80	May 07	Rehabilitates facility
LA 710	I-405 to Firestone, rehabilitate roadway (long-life pavement)	123	2007	Rehabilitate facility
LA 710	Firestone Blvd. to I-10, rehabilitate roadway	37	2007	Rehabilitates facility
RIV 215	Widen I-215 in Riverside from six to eight lanes, add auxiliary lane, truck bypass and climbing lanes	399	Apr 07	Increases capacity
SBD BNSF	Add third main rail in the Cajon Pass	35	2005	Increases capacity
LA various locations	In Los Angeles and Pomona, along Union Pacific line from Redondo Junction to East End Ave., safety and traffic signal improvements, roadways widenings, and grade separations	910	Aug 07	Improves operations

4. Additional Improvements Necessary[7]

Highway Improvements

County/ Route	Project Title/Description	Cost (in millions)[8]	Short/Mid/ Long Term[9]	Primary Impact
LA 5	Orange Co. line to I-605, widen for HOV and mixed flow lanes	163	Mid	Increases capacity
LA 5	Carmenita interchange improvement	186	Mid	Improves operations
ORA 5	I-5/SR-57/SR-22 interchange to SR-91, add truck lanes in both directions	40	Mid	Improves operations
ORA 5	Reconstruct southbound Alton off-ramp	50	Long	Improves operations

[7] Based on Southern California Association of Governments, "Southern California Regional Strategy for Goods Movement, A Plan for Action," February 2005, and additional Caltrans inputs.
[8] Current dollars, not escalated.
[9] "Short" term is less than 5 years; "mid" term is 6 to 10 years; "long" term is 10 to 20 years.

County/ Route	Project Title/Description	Cost (in millions)[8]	Short/Mid/ Long Term[9]	Primary Impact
SBD 10	Cherry Ave. interchange reconstruction	23	Mid	Improves operations
SBD 10	Reconstruct Tippecanoe Ave. interchange, construct auxiliary lanes and improve local street	77	Mid	Improves operations
SBD 10	Add eastbound truck climbing lane near Banning	75	Mid	Improves operations
SBD 15	Wheaton Springs, Bailey Rd. to Yates Well Rd., construct truck descending lane (northbound)	23	Short	Improves operations
SBD 15	Near Wheaton Springs, construct commercial vehicle enforcement facility	34	Short	Improves operations
SBD 15	I-15 truckway	10,100	Long	Increases capacity
SBD 40	Near Needles, construct vehicle enforcement facility	25	Short	Improves operations
LA 47	Alameda Corridor SR-47 expressway (includes Schuyler Heim Bridge replacement)	440	Short	Increases capacity
LA 47/ 110	Develop roadway and Vincent Thomas Bridge access enhancements	23	Mid	Increases capacity
ORA 57	Add auxiliary lane, northbound from Katella off-ramp to Lincoln	21	Short	Improves operations
ORA 57	Northbound Orangethorpe to Lambert Road, add auxiliary lane and 4th through lane through the SR-91 interchange	69	Mid	Improves operations
ORA 57	Truck climbing lane Lambert to Los Angeles Co. line	68	Long	Improves operations
SBD 58	Near Kramer Junction, widen to 4-lane expressway	156	Mid	Increases capacity
SBD 58	Near Hinkley-Realign and widen to 4-lane expressway	114	Mid	Increases capacity
RIV 60	Near Mira Loma, add 2 HOV lanes and 2 mixed flow lanes, widen 5 interchanges and one overhead	41	Short	Improves operations
RIV 86	At SR-195, construct new interchange	40	Mid	Improves operations
ORA 91	Westbound from SR-57 to I-5, add truck lane	20	Short	Improves operations
ORA 91	Eastbound between SR-241 and SR-71 add auxiliary lanes	39	Short	Improves operations
RIV 91	Add one mixed flow lane each direction from Riverside/Orange Co. line to Pierce St./Corona	161	Mid	Increases capacity
ORA 91	Eastbound add auxiliary lane between Lakeview Ave. to SR-241	37	Long	Improves operations
ORA 91	Between SR-241 to SR-71, add truck bypass and auxiliary lanes	100	Long	Improves operations
RIV 91	Reconstruct the SR-71/91 interchange	25	Long	Improves operations
LA 110	8th/9th St. interchange – add auxiliary lanes and modify/reconstruct ramps (two projects)	39	Short	Improves operations
LA 405	La Tijera Blvd. to Jefferson Blvd., add auxiliary lane	39	Short	Improves operations
LA 605	Reconstruct SR-91/I-605 Interchange	240	Short	Relieves bottleneck
LA 605	Reconstruct SR-60/I-605 Interchange	300	Mid	Relieves bottleneck

County/ Route	Project Title/Description	Cost (in millions)[8]	Short/Mid/ Long Term[9]	Primary Impact
LA 605	Reconstruct I-10/I-605 Interchange	130	Mid	Relieves bottleneck
LA 605	Reconstruct I-105/I-605 Interchange	125	Long	Relieves bottleneck
LA 710	Reconstruct SR-60/I-710 Interchange	230	Short	Relieves bottleneck
LA 710	Replace Gerald Desmond Bridge	605	Mid	Increases capacity
LA 710	I-710 corridor improvements, including dedicated truck lanes	4,500	Long	Increases capacity
LA/SBD	East-West Corridor	4,300	Long	Increases capacity

Rail Improvements

Railroad/ Location	Project Title/Description	Cost (in millions)	Short/Mid/ Long Term	Primary Impact
BNSF, Port of LA	BNSF Port of Los Angeles/Long Beach Near Dock Facility	150	Short	Enhances access
UP or BNSF, LA/LB Ports to SBD/RIV	Short-Haul Rail Inter-modal Service and Inland Terminal	6(	Short	Enhances access
UP-BNSF, LA/ORA/ RIV/SBD	Alameda Corridor East-Grade separations, grade crossing improvements	2,500	Short	Mitigates impact
UP-BNSF, LA/ORA/ RIV/ SBD	Rail capacity improvements, including mitigation measures[10]	3,400	Mid	Improves capacity
UP-BNSF/SBD	Colton Rail Grade Separation	9(	Mid	Improves operations

Seaport Access Improvements

Sponsor/ Location	Project Title/Description	Cost (in millions)	Short/Mid/ Long Term	Primary Impact
Port of Long Beach	Port Rail System Improvements	1(	Short	Enhances access
Port of Long Beach	Pier B Street Rail Yard Expansion	6(	Short	Improves capacity
Port of Hueneme	Port/Rail Inter-modal Access	1(	Mid	Enhances access

[10] Costs associated with surface traffic and other mitigation measures may be greater than current cost estimates reflected in the Alameda Corridor East total. Accordingly, additional mitigation needs are included in the rail capacity improvement total for this project.

D. Bay Area Region

1. Characterization of Existing "Port-to-Border" Operations

Goods movement drives the economy of the Bay Area and Northern California, which is heavily dependent on the transportation network for both internal circulation and the region's connection to the rest of California and the United States. But congestion on this network and the reliability of trip times has become major concerns for those who move freight within, into, and out of the Bay Area. Major elements of this transportation network include Interstates 80, 238, 580, and 880 and U.S. Route 101. Interstate 80 is a connector to the transcontinental truck network and carries the third-highest truck volumes in the region. Interstate 580 is the primary east-west connector to Interstate 5, the primary artery between the Bay Area region and Southern California. U.S. Route 101 is a gateway corridor in the southern portion of the region. Interstates 238 and 880 provide critical highway links internally in the Bay Area in the movement of goods, with Interstate 880 carrying the highest volume of truck traffic in the region and among the highest of any highway in the State.

Both the Burlington Northern and Union Pacific have major operations in the Bay Area, including Burlington Northern's Richmond yard and Union Pacific's Oakland yard. Burlington Northern also operates the Port of Oakland's Joint Inter-modal Terminal as the Oakland International Gateway. Union Pacific's main line accesses the region via Martinez from Sacramento. It also has one active secondary line through the Altamont Pass. Burlington Northern's main line accesses the region from Stockton also via Martinez.

Four commercial merchandise ports serve the Bay Area: Oakland, San Francisco, Redwood City, and Richmond. The Port of Oakland handles virtually all containerized cargos, although the Port of San Francisco still handles a limited number of container shipments. Unlike at the Ports of Los Angeles and Long Beach, export cargo volumes at Oakland exceed import cargo volumes. Redwood City handles primarily construction materials. The Port of Richmond, along with private port facilities at Benicia and along the Carquinez Strait, handle petroleum products, raw sugar, and auto imports. The region also has the second and third largest (by volume) air-cargo airports in the State, with San Francisco International Airport specializing in international freight and Oakland International Airport specializing in domestic freight. Air cargo is the fastest-growing segment of the Bay Area goods movement system. Air cargo volumes are forecast to triple between 1998 and 2020, generating a corresponding 125 percent increase in all-cargo flights.

2. Current vs. Future Estimates of Traffic

In the Bay Area, annual truck vehicle miles of travel is projected to grow from 1,738 billion miles to 2,368 billion miles, an increase of almost 74 percent, with the counties of Alameda and Santa Clara accounting for the most significant increases.

3. Improvements Underway

County/Route	Project Title/Description	Cost (in millions)	Estimated Completion Date	Primary Impact
SCL 880	Widen ramps on the I-880/Coleman Ave.	70	2006	Enhances access
Port of San Francisco	Illinois St., construct truck/rail bridge across Islais Creek	23	2006	Enhances access

4. Additional Improvements Necessary

Highway Improvements

County/ Route	Project Title/Description	Cost (in millions)	Short/Mid/ Long Term	Primary Impact
SOL 80/ 680/12	Complete I-80/I-680/SR-12 interchange improvements	706	Long	Improves operations
SCL 152/156	SR-152/156 interchange	2	Short	Improves operations
SCL 152	SR-152 safety, intersection improvements	2	Mid	Improves operations
SCR 152	Upgrade SR-152 to a limited access 4-lane freeway	432	Long	Increases capacity
ALA 238	Widen I-238 from 4 to 6 lanes between I-880 and I-580	122	Short	Increases capacity
ALA 238/580	I-238/I-580 truck bypass lane	120	Long	Improves operations
ALA 580	I-580 eastbound truck climbing lane	6	Long	Improves operations
ALA 880	I-880/29th Ave. interchange safety and access improvements near Port of Oakland	105	Short	Enhances access
ALA 880	I-880/High St. interchange improvements	1	Mid	Improves operations
ALA 880	Davis St overcrossing	1	Mid	Improves operations
ALA 880	29th/Fruitvale Area access improvements	2	Mid	Enhances access
ALA 880	I-880/29th Ave. interchange improvements	1	Mid	Improves operations
ALA 880	I-880 Broadway/Jackson interchange improvements	2	Mid	Improves operations
ALA 880	Reconstruct southbound I-880 on and off ramps	2	Mid	Improves operations
ALA 880	I-880/Hegenberger to I-980	2	Mid	Improves operations

Rail Improvements

Railroad/ Location	Project Title/Description	Cost (in millions)	Short/Mid/ Long Term	Primary Impact
UP or BNSF, ALA/SJ/ STA/FRE/TUL/ KIN/KER	California Interregional Inter-modal Service Inland Rail Shuttle – to and from the Port of Oakland to Shafter, via Stockton and Fresno.	1	Short	Increases capacity
UP, ALA/CC	Railroad Corridor Improvements	10	Long	Improves operations
UP, CC/SJ	Reestablish service between Martinez and Tracy	2	Long	Increases capacity

Seaport Access Improvements

Sponsor/ Location	Project Title/Description	Cost (in millions)	Short/Mid/ Long Term	Primary Impact
Port of Oakland	Port of Oakland Harbor Navigation Improvement Project – Dredging to 50 feet	302	Short	Enhances access
Port of Oakland	Truck parking facilities	1	Short	Mitigates impact
Port of Oakland	Access improvements to Joint Inter-modal Terminal (JIT) and UP inter-modal facility.	1	Short	Enhances access
Port of Oakland	JIT Expansion	8	Mid	Increases capacity
Port of Oakland	Reconstruction of the Adeline St Overpass	6	Long	Enhances access
Port of Oakland	Realignment of Maritime Street	3	Long	Improves operations
Port of Oakland	Reconstruction of 7th Street/UP Grade Separation	6	Long	Improves operations

Airport Access Improvements

Sponsor/ Location	Project Title/Description	Cost (in millions)	Short/Mid/ Long Term	Primary Impact
Oakland Int.	North Airport Air Cargo Access Improvements	1	Short	Enhances access

E. San Diego/Border Region

1. Characterization of Existing "Port-to-Border" Operations

Transborder international trade dominates freight operations in San Diego and Imperial Counties. Of the current two million international border truck crossings (northbound and southbound), 78 percent of all trade is destined for locations outside of the San Diego/Border Region. Approximately 57 percent of truck trips have origins or destinations to other counties within California, while at least 21 percent have origins or destinations in other U.S. states or international locations.

Six ports of entry serve this region of which two, Otay Mesa and Calexico East, handle 97 percent (by value) of all border shipments. The Otay Mesa Port of Entry processes 70 percent of the trade between California and Mexico, which includes such major commodities as electrical machinery and equipment, machinery and mechanical appliances, and apparel/clothing accessories.

In 1993, California identified a NAFTA Network (NAFTA-Net) of critical transportation corridors serving trade and traffic through the land ports of entry between California and Mexico. These NAFTA-Net corridors, together with the main access routes north to Los Angeles, make up the predominant elements of the highway transportation network serving the region. This includes north-south routes Interstates 5, 15, and 805 and State Routes 7, 11, 86, and 905. Away from the border, Interstate 5 is the predominant interregional truck route, although Interstate 15 has seen considerable increases in truck volumes in recent years.

The Burlington Northern Santa Fe maintains a freight easement over 62 miles of coastal mainline owned by the North County Transit District. Burlington Northern carries imported automobiles (off-loaded at the Port of San Diego) and lumber and soda ash for export. Recently, the San Diego and Arizona Eastern Railway was refurbished and restored to functionality by Carrizo Gorge Railway, Inc. This railway opens a potential rail linkage eastward from San Diego to Imperial County and interstate points east.

Two marine terminals are operated by the Port of San Diego, the 10th Avenue Marine Terminal and the National City Marine Terminal at 24th Street. Combined, the terminals handle approximately 2.5 million tons of cargo annually, including automobiles, produce, and bulk commodities.

The San Diego International Airport (Lindbergh Field) is the primary site for air cargo, though some is also handled at smaller general aviation airports in the region. The San Diego Regional Airport Authority is in the midst of a state-mandated process to address the region's long-term air transportation needs, including identifying a potential site or sites for a new airport.

2. Current vs. Future Estimates of Traffic

Annual truck vehicle miles of travel are projected to increase from 1,089 billion to 1,745 billion miles in the San Diego/Border Region between 2005 and 2025, a 64 percent increase. In 2003, approximately 2 million trucks crossed the California/Mexico border. Caltrans projects this number will increase to 3.1 million trucks in 2010 and 5.6 million trucks by 2030.

3. Improvements Underway

County/ Route	Project Title/Description	Cost (in millions)	Estimated Completion Date	Primary Impact
SD 5	I-5/805 widening project	186	Short	Improves operations

County/ Route	Project Title/Description	Cost (in millions)	Estimated Completion Date	Primary Impact
SD 15	I-15 operational improvements from SR-52 to Lake Hodges overcrossing	83	Short	Relieves bottleneck
SD 15	I-15 widening/managed lanes from SR-56 to Center City Parkway	375	Short	Improves operations
IMP 7	Four-lane expressway from SR-98 to I-8	64	Apr 05	Increases capacity
IMP 78	Brawley Bypass Stage 1: four-lane expressway from SR-111 to SR-78	14	Sep 05	Improves operations
IMP 111	Four-lane expressway from I-8 to SR-78 (final stage, first two stages open)	125	Mar 05	Increases capacity
SD 125	Segment 1: SR-905 to SR-54, new six-lane freeway	400	Jun 06	Increases capacity
SD 125	Segment 2: widening to six-lanes from SR-54 to SR-94	138	Mar 05	Increases capacity
SD 905	Phase 1 of SR-905 freeway, Siempre Viva Interchange	29	Sep 05	Improves operations

4. Additional Improvements Necessary

Highway Improvements

County/ Route	Project Title/Description	Cost (in millions)	Short/Mid/ Long Term	Primary Impact
SD 5	I-5 north coast widening, including HOV lanes and auxiliary lanes, from I-805 to Vandegrift	672	Mid	Increases capacity
SD 11	SR-11 four-lane freeway from Mexico Border (Otay Mesa) to SR-905	196	Mid	Enhanced access
SD 15	I-15 operational improvements from SR-52 to SR-78	19	Short	Relieves bottleneck
SD 15	I-15 widening/Managed Lane – from SR-163 to SR-56	253	Mid	Improves operations
SD 15	I-15 widening from Center City Parkway to SR-78	140	Mid	Increases capacity
IMP 78	SR-78 Brawley Bypass four-lane expressway Stages 2 and 3	97	Short	Improves operations
SD 94	SR-94 widening from I-5 to I-15	80	Long	Improves operations
SD 94	SR-94/SR-125 Interchange, add west to north and south to east ramps	85	Long	Improves operations
IMP 115	SR-115 four-lane expressway from I-8 to Evan Hewes Highway	76	Mid	Increases capacity
SD 805	I-805 widening from SR-905 to SR-54	150	Mid	Increases capacity
SD 805	I-805 widening from SR-54 to I-8	450	Long	Increases capacity
SD 805	I-805 widening – Mission Valley Viaduct	250	Long	Increases capacity
SD 805	I-805 widening from I-8 to I-5	380	Long	Increases capacity
SD 905	SR-905 six-lane freeway from Mexico border (Otay Mesa Port of Entry) to I-805	271	Short	Enhanced access

County/ Route	Project Title/Description	Cost (in millions)	Short/Mid/ Long Term	Primary Impact
SD 905 service roads	Otay Mesa Port of Entry truck route - operational improvements	17	Short	Relives bottleneck

Rail Improvements

Railroad/ Location	Project Title/Description	Cost (in millions)	Short/Mid/ Long Term	Primary Impact
San Diego & Arizona Eastern, San Diego/ Imperial	Upgrade, repair and replace track infrastructure	125	Short	Improves operations

Seaport Access Improvements

Sponsor/ Location	Project Title/Description	Cost (in millions)	Short/Mid/ Long Term	Primary Impact
SD 5	I-5 Truck Viaduct to 10th Avenue Marine Terminal (Grade separated access from freeway to Port terminal)	123	Short	Enhanced access
Port of San Diego	Elevate Harbor Drive/Caesar Chavez Parkway intersection to provide truck access over railroad/trolley	15	Short	Mitigates impact
Port of San Diego	Elevate 28th Street/Harbor Drive intersection to provide truck access over railroad/trolley	22	Short	Improves operations

F. Central Valley Region

1. Characterization of Existing "North-South" Operations

Interstate 5 is considered the backbone of California's highway system and serves as a vital gateway into the Central Valley for interstate and international transport of North American trade. Yet in terms of trade origins and destinations, State Route 99, from south of Bakersfield to Sacramento, actually may be more important. Many key corridors to the Central Valley partly derive their goods-movement importance through the connections they provide to other regions, including via Interstates 80 and 205 and State Route 58. Two Class I railroads, Burlington Northern and Union Pacific, provide freight service in the region utilizing shared and parallel facilities. This includes Burlington Northern's shared use of the (currently) at-capacity Union Pacific line over Tehachapi Pass and Union Pacific lines north of Stockton through Sacramento to northeast of Oroville.

The region is served by two main, primarily bulk transportation, inland maritime ports, the Port of Sacramento and the Port of Stockton. Based on its acquisition from the U.S. Navy of the former Rough and Ready Island complex, the Port of Stockton has strong potential for growth, although highway access is a significant concern. The Port of Sacramento is smaller and significantly hampered by inadequate water channel depth,

changing area economics, and encroaching urbanization. In the region, Sacramento International and Mather Airport are two of the State's top ten air-cargo airports, together emplaning over 138,000 tons of goods in 2004.

2. Current vs. Future Estimates of Traffic

In the Central Valley Region, annual truck vehicle miles of travel are projected to increase from 4,677 billion miles to 7,758 billion miles, or 60 percent.

3. Improvements Underway

County/ Route	Project Title/Description	Cost (in millions)	Estimated Completion Date	Primary Impact
SJ 5	SR-99 widening & Hammer Lane construction.	90	Jan 07	Increases capacity
SJ 5	Arch Road interchange	45	Oct 07	Improves operations
TUL 99	Airport overcrossing/"K" St. off-ramp	11	Aug 06	Improves operations
FRE 99	Kingsburg to Selma, 6 lanes	72	Jul 07	Increases capacity
MER 99	Livingston Fwy Stage II	40	Sep 07	Increases capacity
SJ 99	Manteca SR-99/120E widening	11	Aug 06	Increases capacity
SJ 205	Tracy widening Stages II and III	102	Jul 07	Increases capacity

4. Additional Improvements Necessary

Highway Improvements

County/ Route	Project Title/Description	Cost (in millions)	Short/Mid/ Long Term	Primary Impact
SAC 5	Auxiliary lanes, Richards Blvd. to Garden Hwy.	15	Short	Improves operations
SAC 5/80	Revise interchange	35	Long	Improves operations
SAC 5/80	Reconstruct ramp eastbound to northbound	13	Long	Improves operations
SJ 5	Mossdale Wye, add northbound on ramp and extend northbound lane	12	Short	Improves operations
YOL 5	Reconstruct interchange at County Road 102	14	Short	Improves operations
YOL 5/113	Construct northbound 1-5 to southbound SR-113 connection	39	Short	Improves operations
YOL 5/113	Construct northbound SR-113 to southbound I-5 connection	30	Mid	Improves operations
YOL 50	Widen Harbor Blvd. interchange, revise ramps and add auxiliary lanes	32	Short	Improves operations

County/ Route	Project Title/Description	Cost (in millions)	Short/Mid/ Long Term	Primary Impact
KER 58	Dennison Road improvements	11	Short	Improves operations
KER 58	Heath Road to SR-99, widen 4 to 6 lanes	17	Mid	Increases capacity
PLA 80	Capacity improvements and carpool lanes Sacramento County line to east of SR-65	169	Short	Improves operations
KER 99	7th Standard Road widening	14	Short	Improves operations
TUL 99	Goshen to Kingsburg, widen 4 lanes to 6 lanes	134	Mid	Increases capacity
TUL 99	Prosperity Ave. to Goshen, widen 4 to 6 lanes	126	Mid	Increases capacity
FRE 99	Kingsburg to Selma, widen 4 to 6 lanes	58	Short	Increases capacity
MAD 99	Ave 21½ to SR-152/SR-99 interchange, widen from 4 to 6 lanes	49	Short	Increases capacity
MER 99	Mission Ave. interchange freeway conversion	71	Short	Improves operations
MER 99	Atwater Freeway	51	Mid	Improves operations
MER 99	Merced Freeway, Buchanon Hollow to Miles Creek	135	Short	Improves operations
MER 99	Merced Freeway, Madera Co. line to Buchanon Hollow Road	87	Short	Improves operations
STA 99	SR-99/Whitmore Ave. interchange	27	Mid	Improves operations
MER 152	Los Banos bypass	325	Long	Improves operations
SJ 205/580	I-205/I-580 construct auto-truck separation lane	16	Short	Improves operations
SJ 205	Tracy, 11th Ave. to Route 5, widen 4 to 6 lanes	97	Short	Increases capacity
SJ 205/580	I-580 westbound truck climbing lane	70	Long	Improves operations

Rail Improvements

Railroad/ Location	Project Title/Description	Cost (in millions)	Short/Mid/ Long Term	Primary Impact
UP, PLA	Build over/undercrossing at Union Pacific crossing of Sierra College Blvd	3	Long	Relieves bottleneck
UP, Kern	Tehachapi Pass double track	1,000	Long	Increases capacity

Seaport Access Improvements

Sponsor/ Location	Project Title/Description	Cost (in millions)	Short/Mid/ Long Term	Primary Impact
Port of Sacramento	Harbor Blvd., widen from 4 to 6 lanes, West Capitol Ave. to Industrial Blvd.	10	Short	Enhances access

Sponsor/ Location	Project Title/Description	Cost (in millions)	Short/Mid/ Long Term	Primary Impact
Port of Stockton	Daggett Road access	15	Short	Enhances access

G. State Gateways and Central Coast

1. Characterization of Existing Operations

The highways and rail lines that make up the rural or urbanizing State gateways and the Central Coast provide many vital links for intra- and inter-state and international goods movement. The primary goods movement corridors in the region are Interstates 5 and 80; U.S. Routes 97, 101, 199, and 395; and State Routes 41, 46, 152, and 299. The main north/south and east/west lines of the Burlington Northern and Union Pacific and many short-line railroads also serve these regions.

These routes have particular problems. Truck size restrictions on U.S. Routes 101 and 199 and State Route 299 limit the length and types of commercial truck combinations. Bridge facilities on Interstate 5 north of Redding were built based on truck traffic forecasts far below the current level of 8,000 north/south trips per day, resulting in high rehabilitation needs and maintenance requirements. Increasing congestion in the Los Angeles/Inland Empire and the Central Valley Regions is already causing diversion of truck traffic onto U.S. Route 395. The single track Union Pacific Donner Pass line, which still cannot fully handle all double-stack trains, hampers rail freight shipments to and from the Central Valley and the Bay Area Regions. Upgrades of Burlington Northern's line north of Keddie are also required. Reestablishing rail freight service to the North Coast (North Coast Railroad) and longer-term improvements to the Port of Humboldt Bay will provide critical non-highway alternatives to shippers to and through the North Coast. These issues must be addressed as part of any proposed action strategy.

2. Current vs. Future Estimates of Traffic

Between 2005-2020, annual truck vehicle miles of travel in the Northern Gateways and Central Coast regions is expected to increase from 1,410 billion miles to 1,873 billion miles, an increase of 33 percent with some counties experiencing significantly higher growth.

3. Improvements Underway

County/Route	Project Title/Description	Cost (in millions)	Estimated Completion Date	Project Impact
TEH 5	Truck climbing lanes	13	Aug 05	Improves operations

4. Additional Improvements Necessary

Highway Improvements

County/ Route	Project Title/Description	Cost (in millions)	Short/Mid/ Long Term	Primary Impact
SHA 5	Antlers Bridge Reconstruction	145	Short	Rehabilitates facility
TEH 5	Red Bluff Bridges North (bridge replacement)	3	Mid	Rehabilitates facility
SLO 46	Corridor Improvements	2	Mid	Improves operations
SLO 46	Corridor Improvements	209	Long	Increases capacity
NEV 80	Soda Springs interchange to Truckee Agriculture Inspection Station, rehabilitate roadway (two projects)	120	Short	Rehabilitates facility
HUM 101	Confusion Hill bypass	6	Short	Relieves bottleneck
MEN 101	Willits bypass	139	Short	Relieves bottleneck
MON 101/156	Widen SR-156 and construct interchange at US-101/SR-156	222	Long	Improves operations
SHA/TRI 299	Buckhorn grade realignment	118	Long	Relieves bottleneck

Rail Improvements

Railroad/ Location	Project Title/Description	Cost (in millions)	Short/Mid/ Long Term	Primary Impact
UP, Nevada/Placer	Upgrade Donner Pass, double track, tunnel lowering for full double-stack operations	2	Short	Relieves bottleneck
North Coast Railroad	Reestablish rail freight service from south end to Eureka	4	Short	Increases capacity

H. Performance Estimates

The transportation system improvements identified in this chapter will improve goods movement mobility and access, sustain the economy, and reduce the impacts on communities and the environment. Highway capacity and operational improvements will reduce congestion, reduce delay, reduce accidents, increase reliability, improve air quality, and allow freight to move more efficiently.

Heavy-duty diesel trucks move goods primarily on highways. These vehicles are major emitters of diesel particulate matter (PM) and in many areas they are the primary source of nitrogen oxides (NOx). Both the California Air Resources Board and the U.S. Environmental Protection Agency have issued regulations that will, over time, greatly reduce toxic and other emissions from the heavy-duty diesel truck fleet. However, emissions regulations for heavy-duty diesel trucks did not begin to apply until the mid-1990s, unlike emissions regulations for light-duty vehicles that have applied since the early-1970s. It will, therefore, be 10 to 20 years before emissions regulations on heavy-

duty diesel trucks have notable effects. In the interim, traffic flow improvements must be implemented to minimize health impacts due to diesel exhaust because, perhaps to an even greater extent than with light duty vehicles, heavy-duty diesel truck emissions are increased during vehicle acceleration. Thus, smoothing traffic flow (for a constant traffic volume) substantially reduces emissions, providing speeds do not increase excessively. Maximum emissions occur under stop-and-go conditions and during free-flow, high-speed operation. Emissions are minimized under moderate-speed, smooth-flowing conditions.

Increased rail capacity and operational improvements will allow railroads to compete more effectively with trucks on long-haul freight, reducing the number of trucks on highways. A reduction of trucks on highways will lead to a reduction in highway maintenance costs. The identified rail projects will also allow railroads to load more freight near seaports, cutting down on the number of truck movements to and from the seaports. Also, by allowing more trains to go directly to the docks for loading and unloading, the need to dray containers by truck between ports and railheads will be reduced. Rail shuttle trains have the ability to move containers to inland ports 24/7, allowing seaports to double and even triple their throughput without having to build expensive new infrastructure.

In terms of air quality, fuel efficiency and manpower, railroads are also the most efficient means of transporting freight. The U.S. Environmental Protection Agency estimates that for every ton-mile, the average truck emits three times more nitrogen oxide and diesel particulates than a locomotive. Locomotives are three times more fuel-efficient than trucks. Railroads can also help reduce highway congestion. One inter-modal train can take up to 280 trucks off the highway.

The identified seaport projects will improve both truck and rail access to ports and will facilitate freight to be moved off site more efficiently, thereby improving port throughput. These improvements will cut down on the amount of time trucks and trains idle in neighborhoods outside seaports waiting to get in. All of these projects will help the freight movement industry move goods more efficiently, creating more jobs and reducing pollution.

VI. THE CALIFORNIA GOODS MOVEMENT INDUSTRY'S ENVIRONMENTAL IMPACT AND MITIGATION ALTERNATIVES

A. Impacts on Regional Air Pollution

Emissions from port-related goods movement are a significant and growing contributor to regional air pollution. In the Los Angeles region, the emissions resulting from trade through the Ports of Los Angeles and Long Beach will account for about 10 percent of the regional oxides of nitrogen (NOx) emissions and about 25 percent of the diesel particulate matter (PM) emissions in 2005. This report uses the emissions impact in the Los Angeles region to demonstrate how goods movement emissions can affect air quality. However, the contribution of port-related sources in other areas of the State, such as the Bay Area region, while smaller as a percentage of that region's current emissions, is still substantial. Also, trade-related truck and train emissions in the Central Valley are an important and growing concern in that region, which has some of the State's worst air pollution.

A tripling in trade at the Ports of Los Angeles and Long Beach by 2020 would result in about a 50 percent increase in NOx emissions and a 60 percent increase in diesel PM emissions from current levels, unless new pollution-control efforts are instituted.[1] If trade at the ports were to triple, port-related pollution could increase to as much as 20 percent of the regional NOx emissions and 46 percent of the diesel PM emissions by 2020.

Failure to bring port-related pollution under control could have severe air pollution and public health consequences, including a delay in the region's attainment of health-protective air quality standards, higher incidents of serious diseases such as asthma and cancer, and more premature deaths from particle pollution. Failure to bring port-related pollution under control could also have significant adverse economic impacts, including increased health-care and lost-productivity costs and not qualifying with federal requirements for billions of dollars in federal transportation project funding.

B. Community Impacts from Toxic Pollutants

Emissions from port-related goods movement are also a significant and growing contributor to community air pollution. Affected communities include neighborhoods close to major ports, neighborhoods that surround major rail yards, and neighborhoods along major transportation corridors. Specific examples of such communities include Wilmington, Commerce, parts of the Bay Area, and Roseville to name only a few. Throughout California, several million people live in communities impacted by port-

[1] As new equipment replaces older units, new engine emissions standards will achieve some reductions. These reductions, for the most part, will be implemented too slowly to counteract the rapid growth of international trade. Some new engines, such as those that are mandated for use in trucks and heavy equipment between 2007 and 2013, will employ highly effective emissions controls. Newer, cleaner locomotives will begin to be introduced in 2005, but the standards for these engines will be much less stringent than the standards for new trucks. Other categories, such as ocean-going vessels, currently use very highly polluting engines and are not required to employ additional emission control technologies.

related goods movement. In many cases, the affected populations are economically disadvantaged and are least able to obtain quality health care to address air pollution related illnesses.

In communities with significant goods movement activity, a particular concern is exposure to diesel PM. In 1998, the California Air Resources Board identified diesel PM as a toxic air contaminant because of its potential to cause cancer, premature deaths, and other health problems. Health risks from diesel PM are highest in areas of concentrated emissions, such as near ports, rail yards, freeways, or warehouse distribution centers. Exposure to diesel PM is a health hazard, particularly to children whose lungs are still developing and the elderly who may have other serious health problems. The potential cancer risks associated with diesel PM emissions in these communities vary significantly depending on many factors, including:

- The magnitude of the emissions;
- The proximity of the community to goods movement activity;
- Transportation patterns through the community; and
- Local climate and weather.

The greatest health impacts from exposure to diesel PM occurs in areas immediately adjacent to goods movement activity (ports, rail yards, distribution centers, and freeways with a high volume of diesel trucks). In close proximity to these goods movement activity sources the increase in potential cancer risk is likely to exceed 500 in a million above regional background levels. Health impacts decrease the farther one moves away from the goods movement activity sources; however, even at several miles away the increase in potential cancer risk can exceed 10 in a million above regional background levels.

As with regional pollution impacts of port-related emissions, the failure to address community emissions impacts and bring port-related toxic pollutants under control could have severe health consequences in those immediately adjacent neighborhoods—resulting in significantly increased risk of cancer and premature death due to exposure to higher levels of diesel PM.

C. Other Community Impacts

Communities situated along port-related goods movement areas and/or near port sites are subjected also to other conditions associated with ports and the movement of goods, including traffic congestion, noise and light pollution. For example, trucks transporting containers to local distribution centers create traffic problems near the port. In many areas, the physical capacity of local streets and freeways is exceeded as increased container truck traffic shares the road with the general public, resulting in congestion and unnecessary idling.

Noise pollution, according to a National Resources Defense Council report, has been linked to hearing impairment, high blood pressure, sleep deprivation, reduced

performance, and even aggressive behavior. Light pollution can also affect nearby residents causing stress and annoyance.[2]

In many areas of California, residents are increasingly complaining about increases in noise and odors that are directly associated with locomotive activities at rail yards and inter-modal facilities and along the rail lines used by line-haul trains. Rail yard activities of particular concern to nearby residents include prolonged idling and increases in noise resulting from testing locomotives during service and maintenance as well as smoking locomotives.

D. Contribution of Specific Port-Related Sources to Air Pollution Problems

This section examines four major sources of port-related, goods movement emissions:

- Ships;
- Railroads;
- Diesel Trucks; and
- Off-Road Equipment.

The methodology used is to compare the estimated magnitude of emissions from port-related sources in the South Coast Air Basin to other major source categories that affect regional air quality,[3] first for 2005 and then for 2020. Although this quantitative assessment focuses on Southern California, the same source categories are important in other areas of the State with significant port activities. The pollutants of most concern from goods movement are NOx and diesel PM; to simplify this presentation, these are the only pollutants discussed in this Chapter. These pollutants are emitted in large amounts by the ships, diesel trucks, locomotives and cargo handling equipment that move goods to and through California.

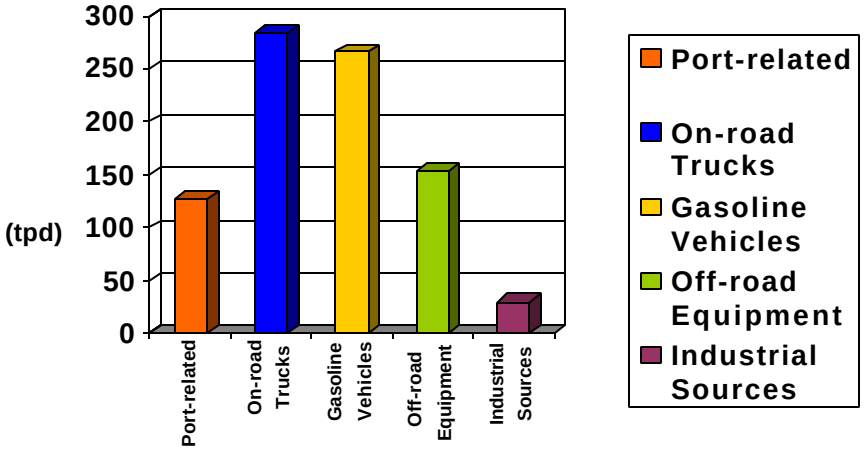
1. Major Sources of Regional Emissions Today and in 2020

Figure 1 shows the 2005 NOx emissions in the Los Angeles area air basin for five major emission categories. This figure indicates that emissions from port-related goods movement are significant, but are not as large as three other major emission categories: on-road (diesel) trucks, gasoline vehicles, and off-road equipment. It also shows the relatively small role played by major industrial emission sources.

[2] NRDC, Harboring Pollution, Aug. 2004

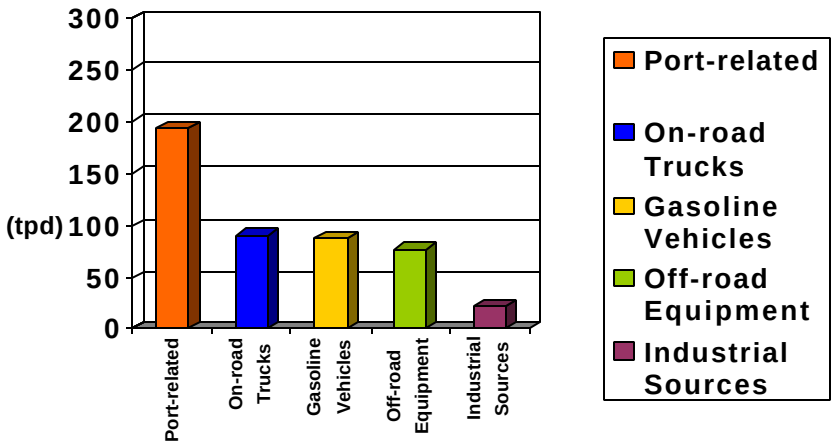
[3] These categories are: on-road (diesel) trucks, on-road gasoline vehicles, off-road (diesel) equipment and industrial sources, such as power plants and refineries. Collectively these source categories contribute almost 90 percent of the basin's NOx and diesel PM emissions.

Figure 1: 2005 NOx Emissions in the South Coast Air Basin



However, as trade increases and engine emission controls are implemented in other emission sources, the significance of port-related emissions shifts dramatically over the next 15 years. As Figure 2 shows, port-related emissions could, unless much more is done to control emissions, grow significantly in importance.[4] By 2020, port-related NOx emissions could account for 20 percent of the region's NOx emissions.

Figure 2: 2020 NOx Emissions in the South Coast Air Basin



Figures 3 and 4 illustrate a similar trend for diesel PM emissions.

[4] Estimates for port related emissions are based on the current emissions inventory for the Ports of Los Angeles and Long Beach and the preliminary growth and control estimates from the No Net Increase Project of the Port of Los Angeles. Estimates for the other categories are taken from the California Emissions Inventory Data Reporting System.

Figure 3: 2005 Diesel PM Emissions in the South Coast Air Basin

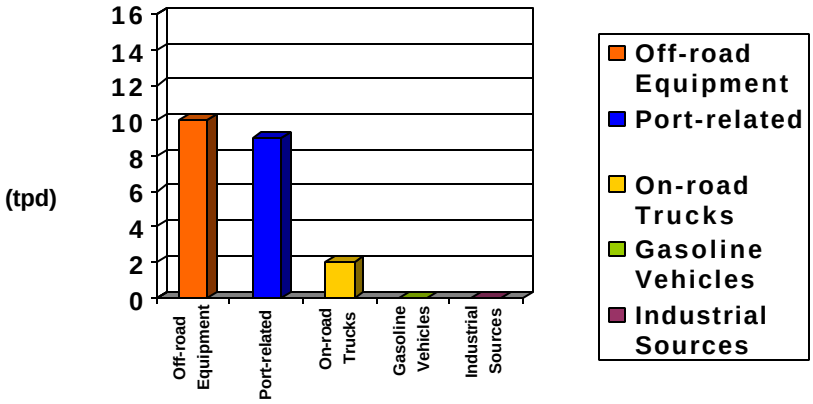
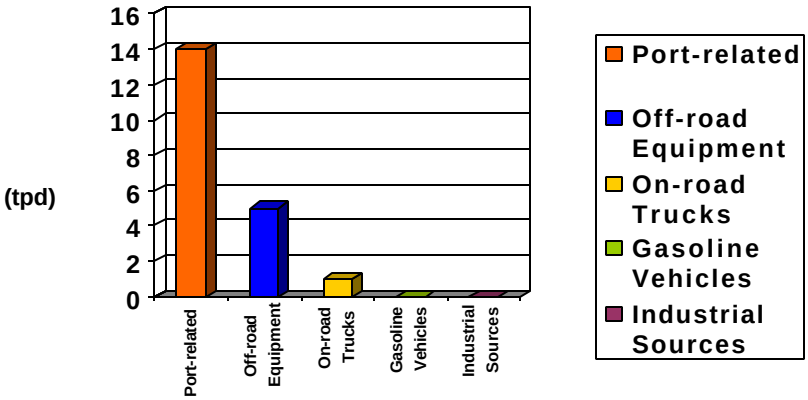


Figure 4: 2020 Diesel PM Emissions in the South Coast Air Basin



Due to the many uncertainties with forecasting 15 to 20 years into the future, these future estimates will need to be refined as new data becomes available. Nevertheless, extensive actions are needed to ensure that emissions from port-related sources are brought under control if they are to avoid becoming the region's single largest emission sector.

2. Emissions and Trends from Port-related Sources

This section provides additional detail on NOx and diesel PM emissions and expected emission trends for the four major categories of port-related emission sources. As Figure 5 shows, ship NOx emissions will increase significantly and will contribute a large majority of the port-related emissions in the future. Rail NOx emissions will decrease through 2010, but will trend upward again unless new engine standards are enacted, and locomotives that meet those standards are deployed. NOx emissions in the other categories are expected to decrease somewhat from current levels, largely due to the fact that many trucks and most off-road equipment will be using new cleaner engines by

2020. However, efforts to accelerate the introduction of these cleaner engines would provide significant benefits in the near-term.[5]

Figure 5: Emission Trends for Various Port-Related Sources in the South Coast Air Basin (NOx)

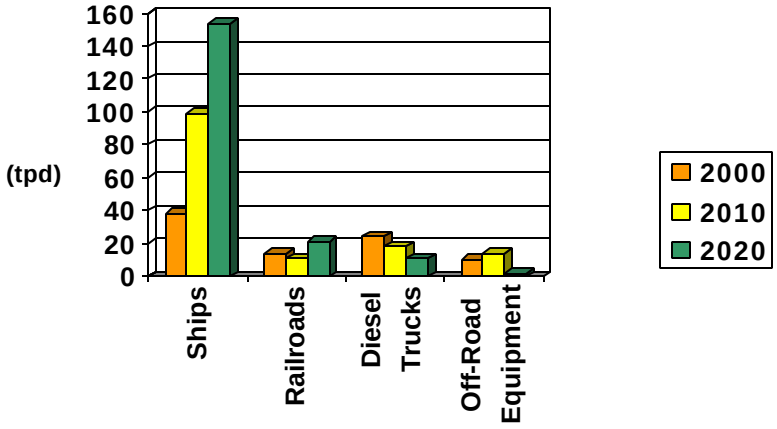
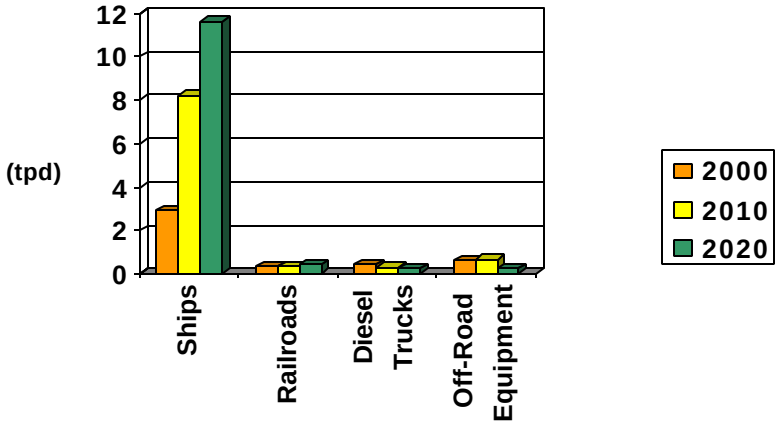


Figure 6 presents the emission trends for diesel PM. Figure 6 shows that diesel PM emissions are similar to NOx in terms of trends and the importance of different sources. Again ship emissions will dominate over time. However, in terms of risk resulting from exposure to diesel PM, sources that operate within the ports or in neighborhoods have more impact than vessel emissions at sea. To properly analyze the risk presented by these sources, the magnitude, location, and timing of emissions must all be considered.

Figure 6: Emission Trends for Various Port-Related Sources in the South Coast Air Basin (PM)



[5] The forecasted growth and control estimates are based on the preliminary information from the Port of Los Angeles No Net Increase Project. These values may change as new information becomes available; however, the relative relationships between the different emission sources are not expected to change.

California Air Resources Board (ARB) staff has begun looking more closely at this issue as the California Environmental Protection Agency seeks to reduce community risk and prioritize its control efforts. Based on ARB's preliminary work, cargo-handling equipment is anticipated to be the biggest contributor of toxic pollutants to neighboring communities. While ocean-going vessel transiting and hotelling emissions contributed about half of the total diesel PM emissions, these emissions will not be responsible for a comparable portion of the potential cancer risk because the diesel PM emissions from ocean-going vessels are distributed over a very wide area and most of the diesel PM emissions (90 percent) are emitted over the ocean. In addition, the emission plume from ocean-going vessels has a much higher dispersion release height due to a higher physical stack height (about 50 meters) of the vessel. Cargo handling equipment, on the other hand, is located in closer proximity to the affected communities and has a much lower dispersion release because of a relatively lower physical stack height (about 4-5 meters). ARB staff plans to have more detailed exposure assessments available within three to four months.

E. Mitigation Alternatives

ARB has adopted and is implementing regulations that will directly reduce emissions from goods movement in both the near- and long-term. In addition, the ports and many local agencies are also taking steps to reduce emissions from goods movement activities. Appendix A is a fact sheet outlining these efforts.

However, in light of the expected growth in the California goods movement industry, a more comprehensive strategy is needed. In 2005, ARB staff will develop a new comprehensive plan outlining future efforts to reduce emissions from port and rail operations in California. This comprehensive plan will be developed in conjunction with a broad array of stakeholders including the U.S. Environmental Protection Agency (U.S. EPA), California ports, local transportation agencies and air quality management districts, environmental and community groups, shipping lines, terminal operators, truck operators, and the railroads. There will be significant hurdles to overcome including the cost of regulatory mandates, the availability of low emission technologies, the desire to accelerate implementation, and the need for action at the national and international levels.

Below is a general description of some of the strategies that will be evaluated as the comprehensive plan is developed. The strategies are presented by emission source category and described briefly. Details of the potential measures that will be identified for the comprehensive plan are not included here but will be developed through the public process described above. The category-by-category discussion is followed by an overall summary of the implementation mechanisms that might be employed. Key emission reduction strategies for air quality include:

1. Ocean Going Vessels

Ocean going vessels are the largest and most challenging emissions source. They employ engines and fuels that have not been subjected to rigorous pollution control requirements.

Ocean going vessels are predominately owned and operated by foreign entities and are difficult to regulate at the state or even national level. Ultimately what is needed are international fuel and engine standards that apply cost-effective emission controls on new ships. Unfortunately, it is unlikely that such standards will occur quickly enough to address the rapid growth of trade in California. As a result, other strategies will be needed to substantially reduce vessel emissions:

a. Use of Lower Polluting Engines on New Ships Destined for West Coast Service

The International Maritime Organization adopted modest emission standards for NOx that have been implemented on vessels built since 2000. However, ship engine manufacturers have the ability to produce vessels with significantly lower emissions if there is a demand for these cleaner engines. Further, there are numerous emission reducing technologies that could be incorporated into vessel design. These technologies include selective catalytic reduction (SCR), electrical system modifications to allow for shore power connections, fuel system modifications to allow the use of water emulsified fuels, intake air humidification, water injection, lower emission fuel injectors, oxidation catalysts for auxiliary engines using lower sulfur fuel, and cylinder lube oil control technologies on main engines. Many of these technologies are best designed and installed on new vessels. For example, SCR can be very difficult to install as a retrofit due to size constraints and other factors, which do not exist if SCR is incorporated during new vessel construction. In addition, there may be other opportunities selectively to deploy new cleaner vessels to California's major ports.

b. Emission Retrofits on Ships in Frequent West Coast Service

Many of the same technologies available for new vessels are also available as retrofits on existing vessels. These technologies include SCR, electrical system modifications to allow for shore power connections, fuel system modifications to allow for the use of water emulsified fuels, intake air humidification, water injection, retrofit "slide-valve" fuel injectors, oxidation catalysts for auxiliary engines using lower sulfur fuel, and cylinder lube oil control technologies on main engines. The emission reduction potential of these technologies can be substantial. For example, SCR can reduce NOx emissions by 90 percent. Retrofit controls are most cost effective on ships that make frequent visits to West Coast ports.

c. Use of Cleaner Fuels in Main and Auxiliary Engines When in or near California Ports

The use of cleaner marine fuels can significantly reduce emissions from marine diesel engines. The heavy fuel oils currently used in the main engines (and many auxiliary engines) are among the dirtiest of diesel fuels, containing high levels of sulfur, ash, aromatic compounds, nitrogen and other contaminants. For ship main engines, ARB is working in cooperation with the U.S. EPA to investigate the feasibility of creating a "Sulfur Emission Control Area" or SECA for North America through the International Maritime Organization. A SECA limiting the sulfur content of heavy fuel oils to 1.5 percent would reduce particulate matter by about 20 percent and sulfur oxides by over 40

percent. For auxiliary engines, ARB is currently developing a regulation that would require the use of lower sulfur marine distillate fuel referred to as "marine gas oil." It is estimated that the use of this fuel would reduce particulate matter by more than 60 percent, sulfur oxides by approximately 90 percent, and nitrogen oxides by almost 10 percent, compared to the emissions produced by typical heavy fuel oil.

d. Use of Shore Power

The use of shore power (often called "cold ironing") is the connection of landside electrical power to a vessel, allowing the vessel's onboard diesel generators to shut down. Shore power can result in dramatic reductions in emissions, even considering the power plant emissions associated with electricity generating utility plants. For example, emissions reductions of NOx and diesel PM would be reduced by more than 95 percent. Shore power requires significant infrastructure investments both at the dock and on the vessel. In addition, the landside power can be more expensive than the power generated by the ships onboard generators. Nevertheless, several existing and planned installations of shore power demonstrate that this strategy is feasible in certain situations. Generally, shore-power projects are most cost-effective for vessels that visit the same port relatively frequently, require large electrical loads at the dock, and stay at the dock for longer periods of time. The Port of Long Beach commissioned a report examining the feasibility and cost-effectiveness of shore power at their facility; ARB is developing a report examining similar issues on a statewide basis.

e. Use of More Efficient Ships and Improving Efficiency of Container Loading and Unloading

Improvements in the design and operation of ships and cargo-handling equipment can reduce emissions of all pollutants. For example, larger container ships generally result in fewer emissions per container transported compared to the transport of the same number of containers with a greater number of smaller vessels. Improvements in container ship design also allow vessels to carry more containers for a given vessel size. Strategies to load or unload a vessel more quickly can also reduce emissions by limiting the time the vessel is at the dock running diesel auxiliary engines. Strategies to load or unload vessels more quickly can include increasing the number of cranes servicing each vessel, installation of faster cranes, use of straddle or shuttle carriers to supplement yard trucks, use of dockside rail systems, and 24-hour loading or unloading operations.

2. Cargo-Handling Equipment

Cargo-handling equipment is probably the most significant category of emissions contributing to regional and community pollution. Strategies that could reduce emissions from this cargo-handling equipment include:

a. Use of Less Polluting On-Road Engines in Yard Trucks

One opportunity for reducing both diesel PM and NOx emissions is to replace yard trucks powered by off-road engines with those powered by on-road engines. The on-road yard trucks are fully capable of performing in an off-road environment, and the emissions benefits are significant. The NOx and diesel PM emission limits for new on-road engines are, respectively, approximately 50 percent and 35 percent lower than those for new off-road engines. With the 2007 model year, the diesel PM benefits would be even greater, up to 90% lower as compared to a new off-road engine.

b. Diesel PM Emission Retrofits on All Eligible Equipment

For the off-road, diesel-fueled mobile cargo-handling equipment that does not have the capability of being replaced with on-road equipment, ARB has verified several retrofit control devices that may be applicable to control diesel PM emissions, and in some cases, NOx emissions. Currently, there are three Level 1 (at least 25 percent diesel PM reduction), one Level 2 (at least 50 percent diesel PM reduction), and one Level 3 (at least 85 percent diesel PM reduction) devices that are approved for off-road cargo handling equipment—and two of these also achieve 20 percent to 80 percent reduction in NOx emissions.

c. Modernization of Fleets

Accelerating the turnover of older equipment to equipment meeting new certified off-road Tier 4 engine standards is another option for reducing diesel PM and NOx emissions. Depending on the size of the engine, Tier 4 standards are 67 percent to 89 percent lower than current Tier 2 standards for NOx and 50 percent to 95 percent lower than current Tier 2 standards for diesel PM. Tier 4 off-road engine standards will become effective for most engines with the 2011 model year.

d. Greater Use of Cleaner Alternative Fuels and Electricity

Increasing the use of cleaner alternative fuels, such as compressed natural gas, liquefied natural gas, and liquefied petroleum gas (propane) as well as alternative diesel fuels, such as emulsified diesel and ethanol diesel, are another option for achieving diesel PM and NOx emission reductions. In addition, most railed cranes located at ports have been electrified, and while no other applications of electric cargo-handling equipment are known, it remains an option for some equipment.

3. Port Trucks

In the South Coast Air Basin, port trucks account for about 9 percent of the regional NOx emissions and 25 percent of the diesel PM emissions. Truck operations at other California ports also contribute toxic pollutants to their respective regions, but to a lesser degree. In addition to increasing regional diesel PM emissions, concentrated truck traffic through surrounding communities results in higher localized risk. There are several

approaches that can be used to reduce emissions associated with truck activity at ports and rail facilities.

a. Fleet Modernization

California has between 20,000 and 40,000 trucks at ports engaged in moving containers, with the largest concentration operating in the South Coast Air Basin from the Ports of Long Beach and Los Angeles. Preliminary 2002 data indicates that the average age of a port truck is 12 years (corresponding to a 1992 model year) and that approximately 28 percent of the total fleet is more than 16 years old (model year 1988 or older). Programs that accelerate the turnover of the older on-road trucks with newer, cleaner trucks will significantly reduce both diesel PM and NOx emissions. Currently available, new trucks generate 80 percent less diesel PM than a 1988 model year truck. Beginning in 2007, engine manufacturers will offer on-road trucks that will generate 90 percent less diesel PM than the 2004 model year trucks.

b. Diesel PM Retrofit Controls

Another option to reduce emission from port trucks is to retrofit existing trucks with emission control systems. Several systems for reducing diesel PM emissions from on-road trucks have been verified by ARB. While not every make and model of truck can be retrofitted, this option is less expensive than purchasing a new truck and can reduce diesel PM emission to near new-truck levels.

c. Improved Efficiencies and Reduced Idling

A third option to reduce diesel PM and NOx emissions at ports is to improve the efficiency of the process of transferring containers to trucks. Efficiency improvements that speed up the loading and unloading process will reduce emissions associated with equipment idling. Also, improvements that speed up the processing of documents will reduce delays and the associated idling emissions.

4. Locomotives

Locomotive activity in and near ports and inter-modal rail facilities are a significant source of diesel PM and NOx emissions. Strategies to reduce these emissions include:

a. Adoption of Highly Effective “Tier 3” Engine Standards by U.S. EPA

The U.S. EPA has proposed the adoption of new locomotive emission standards, commonly referred to as “Tier 3,” which would apply to new locomotives manufactured in 2011 and beyond. The application of exhaust after treatment technologies in new locomotives could reduce both NOx and PM locomotive exhaust engine emissions by as much as 90 percent. These emission standards would leverage on already adopted federal requirements for using low sulfur diesel fuel by all locomotives beginning in 2012. The

U.S. EPA plans to publish the proposed "Tier 3" locomotive emission standards in mid-2005 and issue a final rulemaking in mid-2006.

b. Accelerated Use of Locomotives That Employ Tier 3 or Equivalent Technologies

The useful life of a locomotive can exceed 30 years. As a result, strategies that would accelerate the use of locomotives that employ Tier 3 or equivalent technologies in California would provide significant diesel PM and NOx reductions. The current Rail MOU uses an "accelerated introduction" approach.

c. Application of Diesel PM Retrofit Controls and Other Measures to Reduce Emissions from Switching Operations

Because switcher locomotives typically operate in and around rail yards, the health impacts associated with their operation at rail yards near densely populated urban areas can pose significant air toxics risks. Retrofitting switcher locomotives with diesel PM filters or diesel oxidation catalysts, where possible, will significantly reduce emissions from these locomotives. Other options to reduce emissions from switcher locomotives are greater use of innovative technologies like the hybrid switcher, the multi-engine switcher, and alternative fuels.

d. Accelerate Efforts to Reduce Locomotive Idling Emissions

A recent risk assessment of the Union Pacific rail yard in Roseville concluded that 45 percent of the cumulative risk from this facility was due to diesel PM emissions from locomotive idling. While some idling is necessary, emissions can be reduced by eliminating unnecessary idling. Installation of anti-idling devices will eliminate unnecessary idling by automatically shutting down the locomotive when not in use. All new locomotives could be required to have anti-idling devices as standard equipment. For locomotives which cannot be equipped with automated anti-idling devices, operational changes at rail yards could minimize the length of time idling is needed for operational or safety concerns.

5. Commercial Harbor Craft

Commercial harbor craft include tugboats, commercial fishing vessels, commercial passenger fishing vessels, workboats, crew boats, ferries, and some U.S. Coast Guard and military vessels. These vessels generally stay within California coastal waters and often leave and return to the same port. Most harbor craft use diesel-powered propulsion and auxiliary engines. In addition, the port facilities where these marine vessel emissions are concentrated are often located near population centers. Listed below are several emission reduction strategies to reduce emissions from commercial harbor craft.

a. Adoption of standards for new engines

New engine standards can provide significant toxic pollutant reductions over time. The International Maritime Organization established NOx standards in Annex VI to the International Convention for the Prevention of Pollution from Ships in 1997. The NOx standards range from 9.8 to 17 g/kW-hr, depending on the engine speed. In addition, the U.S. EPA promulgated final exhaust emission standards for new diesel engines over 37 kW (50 hp) on December 29, 1999, with implementation dates ranging from 2004 to 2007, depending on engine size. Emission reductions from the international and federal rules are expected to be modest. The NOx standards will not achieve significant reductions until after 2010, because the standards apply only to new engines introduced beginning in 2004-2007. In addition, the diesel PM and CO standards are effectively caps in many cases, designed primarily to prevent increases rather than achieve reductions in existing levels. More stringent new engine standards based on after treatment technology similar to that being required of land-based equipment could result in significant reductions of NOx and diesel PM emissions.

b. Engine Emission Retrofits, Rebuilds, and Replacement

There are a variety of options for reducing the emissions from existing vessels. The use of add-on control equipment, such as diesel oxidation catalysts, diesel particulate filters, selective catalytic reduction, and lean-NOx catalyst can provide substantial emissions benefits. However, like ocean-going ships, not many harbor craft have installed retrofit controls and the feasibility of adapting controls is generally vessel specific. Re-powering of existing vessels with cleaner new engines can result in significant emission benefits. Under the Carl Moyer program, over 300 vessels have been re-powered with cleaner new engines resulting in significant NOx and diesel PM emission reductions.

c. Use of Cleaner Fuels

Commercial harbor craft in California generally use either U.S. EPA or California on-road diesel fuel except ferries carrying more than 75 passengers, which have been required to use California on-road diesel fuel since January 1, 2003. Recently ARB passed a regulation requiring all commercial harbor craft to use California on-road diesel fuel. California on-road diesel fuel would be required in the South Coast Air Basin starting in January 2006 and the rest of the state in January 2007. Using California on-road diesel fuel will reduce NOx and diesel PM emissions and enable the use of exhaust treatment devices. Other fuels may also provide benefits such as use emulsified diesel fuel or bio-diesel.

d. Use of Shore Power

Like ocean-going vessels, harbor craft typically run on-board diesel generators when at rest in port (hotelling) to generate electrical power for lights and equipment on-board. Use of landside electrical power instead of on-board diesel generators can result in

reductions of both NOx and diesel PM emissions. Currently at the Port of Los Angeles, one tugboat company is connecting to shore power while their vessels are at the dock.

6. Transportation System Efficiencies

Moving cargo more efficiently from vessel to rail or truck or vice versa, can reduce emissions and related air quality impacts. Transportation system efficiencies include:

a. Improved Port Operations

Some of the strategies being evaluated to improve port operations include greater reliance on advanced information technologies, expanding off-hours operations at ports and related warehouse distribution centers, and use of incentive programs. Advanced information systems increase the efficiency of goods moving through the port and beyond. An example of this is the ports of Long Beach/Los Angeles Advanced Transportation Management, Information and Security System. While the system is designed to reduce costs through greater cargo handling efficiencies, it will also serve to improve traffic flow, thereby reducing idling.

Another strategy for improving port operations is expanding operating hours to off-peak periods. This must be a collaborative effort among the ports, importers, exporters, and warehouse and distribution center operators to expand hours so that terminal truck traffic can operate at night and on weekends. With a 24-hour coordinated operation of goods movement, truck flow can be better managed to reduce congestion on access roads.

Incentive programs are also being developed to promote operations at ports during off-hours through the use of fees. PierPASS is an example of such a program being designed for the ports of Los Angeles and Long Beach. With PierPASS, a “traffic mitigation fee” is charged based on container size. If the container is moved during off-peak hours, the fee is refunded.

b. Greater Use of Rail

Rail must also face the challenge of increasing capacity while reducing congestion. Solutions include increased use of on-dock rail, more efficient use of containers, improved rail crossings, and rail shuttles between ports and intermodal facilities.

At the port, on-dock rail will allow cargo to be transferred directly from ship to train. This will eliminate truck traffic in and around ports and on freeways. More efficient use of containers being shipped to and from ports will also reduce congestion. Fifty percent of the time, international marine containers on the highway are empty. An example of more efficient use of containers is the Port of Oakland alliance with Northwest Container Services to re-use in-bound and out-bound containers at in-land intermodal facilities.

Improved at-grade railroad crossings, especially in dense urban areas, need to be addressed. Unseparated rail/highway crossings doubly reduce efficiency because of

lower rail operating speeds and blockages of truck traffic. Freight rail expressways, such as the Alameda Corridor eliminate many street/railroad crossings.

Another strategy being proposed to enhance the use of railroads and to reduce truck traffic is shuttle trains between ports and intermodal facilities. The California Inter-Regional Intermodal System (CIRIS) is an example. CIRIS is a demonstration project for a container shuttle train between the Port of Oakland and Port of Stockton, which will reduce traffic between the Bay Area and Central Valley.

c. Reduction of Congestion from Port-related Goods Movement

Certain segments of streets and highways have a higher percentage of truck traffic due to the movement of goods. Reducing roadway congestion is critical to reducing air pollution impacts in these areas. Dedicated truck lanes, by-pass routes, and climbing lanes on key goods-movement corridors may help alleviate street and highway congestion.

Improving both truck and rail port access is also necessary to reduce congestion. One strategy is a truck appointment system. With a truck appointment system, truck traffic will be spread more evenly throughout operating hours. To allow more efficient use of the Alameda Corridor a new intermodal transfer facility is being planned near the Port of Los Angeles. This will allow trucks to travel shorter distances before transferring containers to railcars.

F. Implementation Approaches

Mitigating the environmental impacts of the rapidly growing goods movement industry requires a comprehensive effort employing traditional and innovative approaches. The diversity of emission sources and the international nature of the industry preclude a single entity having jurisdiction over environmental matters. In some cases (e.g., when authority is clear), environmental protection can best be achieved through a traditional regulatory approach. More often, however, either non-traditional or innovative approaches will likely be needed. For many mitigation efforts, a combination of approaches is likely to yield the best results. Each general implementation approach is described below, along with examples of how the approach might be used.

1. Regulations: Traditional rules and regulations are being developed for sources where there is clear regulatory authority. This approach may be pursued on the local, state, federal, or even international level. ARB is pursuing regulations that are designed to reduce port emissions, including proposals to reduce emissions from existing diesel engines through cleaner fuels or retrofits as well as encouraging further action at the federal and international levels.

2. Cooperative Agreements: Cooperative agreements with the affected industries provide an alternative approach where regulatory authority may be in doubt. An example of such a cooperative agreement is the memorandum of understanding

among the shipping industry, ARB, U.S. EPA, and the South Coast Air Quality Management District pursuant to which ships voluntarily slow down near the Ports of Los Angeles and Long Beach. Slowing down reduces engine loads and associated NOx emissions by about one ton per day.

3. Incentives: Incentive programs encourage owners or operators of port equipment to voluntarily reduce their emissions. One example is ARB's Carl Moyer Program, which subsidizes the increased cost of cleaner new engines or retrofit control equipment. Some California ports also subsidize emission reduction projects and provide incentives for cleaner vessels and terminal equipment by considering emissions levels when evaluating candidates for new leases at port terminals. A program implemented at certain Baltic Sea ports, charges a differential port fee under which cleaner vessels pay lower fees.

4. Efficiencies: Improving the efficiency of the systems and equipment designed to move cargo at ports reduces both emissions and the cost of goods delivery. Efficiencies may include port and terminal design improvements, grade separations at intersections, and expanding highway and rail capacity.

5. Fees: Fees may be imposed on some aspect of the goods movement system (such as cargo containers arriving or departing), providing funds for emission reduction projects. Fees may be system designed to encourage owners or operators to voluntarily reduce their emissions or fund reductions from other sources.

G. Costs and Impacts

Precise estimates of the overall cost of environmental mitigation cannot be generated at this time. However, a preliminary estimate of the potential range of costs can be generated based on the emission reductions needed and the cost-effectiveness of other measures designed to control diesel PM and NOx. For example, bringing the projected 2010 port related emissions in the South Coast Air Basin back to 2001 emission levels will require about 60 tons per day reductions in NOx emissions and 5.5 tons per day reductions in diesel PM emissions from the 2010 emissions level. Using existing data from the Carl Moyer Program, the cost effectiveness estimates for control measures in the State Implementation Plan, and potential control strategies for ocean-going ships, achieving the reductions necessary to bring emission levels back to 2001 levels is estimated to cost from $100 million to $200 million annually (or a present value of about $500 million to $1.0 billion). Once emission levels are reduced to 2001 baseline, ongoing costs of several hundred million of investments a year would be needed for air emission mitigation. The cumulative total for air emission mitigation is estimated to be between $2.0 and $4.0 billion.

H. Other Efforts

While ARB is taking action to reduce the community health impacts associated with emissions from existing goods movement activity, it is crucial to minimize future impacts

as well. As the connection between proximity and health risks become clearer, decision-makers in the land-use planning process (typically a local government agency) must take into consideration the impacts from goods movement activity when approving applications for sensitive land uses, such as residences, schools, day-care centers, playgrounds, and medical facilities. As part of ARB's environmental justice program, the staff has developed a draft "Air Quality and Land Use Handbook: A Community Health Perspective." This draft Handbook provides information on key health findings and suggested recommendations to land-use agencies on several toxic pollution source categories, including high volume freeways, ports, rail yards, and distribution centers. Suggested recommendations in the draft handbook include distance parameters within which sensitive land uses should be avoided and consideration of resulting traffic patterns.

I. Next Steps

Success in mitigating the impacts from goods movement activities now and in the future will require aggressive action to implement a wide variety of strategies to reduce emissions from trucks, ships, locomotives, trucks, and cargo handling equipment. California has many efforts underway to improve air quality—those efforts to meet state and federal air-quality standards, reduce public exposure to diesel PM, and meet environmental justice goals will result in emission reductions from goods movement activities throughout the state. To ensure success, ARB will need to continue developing, adopting, and implementing programs to reduce emissions from all sources under its control and encourage other state, local, federal, and international agencies to do the same.

ARB is committed to improving air quality and protecting the public health of all Californians. In addition to continuing to implement the State Implementation Plan and the Diesel Risk Reduction Plan, this year ARB will develop a new comprehensive plan that will describe the steps needed to reduce public health impacts from port and rail activities in California. In developing the plan, the California Environmental Protection Agency and ARB will work with the ports, the railroads, other goods movement stakeholders, local air districts, U.S. EPA, and local communities to develop an enduring plan for ports and rail yards throughout the state. This plan will build upon the regulatory program already mapped out by ARB and U.S. EPA and will identify both financial and regulatory incentives that need to be developed and implemented to reduce air pollution by the California goods movement industry.

J. Conclusion

Although trade greatly benefits California's economy, it severely challenges the state's efforts to protect the environment. The ships, locomotives, trucks and heavy equipment that move goods are significant sources of air pollution. Many local communities, particularly those located around ports and rail yards, are voicing concerns about the adverse public health impacts and congestion that result from goods movement. There is extensive evidence that living in an area impacted by pollution is harmful, particularly for

children and the elderly. Public health must be a key variable in decisions involving goods movement.
Based on current information, it is expected that the levels of harmful emissions will increase along with the growth in trade over the next 15 to 20 years unless steps are taken to counter their increase. If regional and community impacts are to be addressed, health risks reduced, and citizen demands met, comprehensive and aggressive action is needed to reverse current trends. To ensure public health is protected, air-quality mitigation must be fully integrated into goods movement system improvements.

ARB and others are developing many additional measures to reduce emissions from port-related emission sources. Investment in strategies such as fleet modernization, the use of cleaner fuels, and retrofitting trucks, ships, and trains with cleaner emission control technologies can provide substantial air quality benefits. In order for California to accommodate the forecasted growth in goods movement and protect public health, significant penetration of the above-described strategies into the California goods movement industry must occur. ARB is confident that within the next several years these efforts can reverse the trend in all categories and enable emissions to be reduced to manageable levels.

VII. THE SAFETY AND HOMELAND SECURITY DIMENSION

A. Overview

The Maritime Transportation Security Act of 2002[1] (MTSA) provided prescriptive direction to governmental agencies, working in conjunction with local authorities and private entities, pertaining to security of the nation's ports. The MTSA requires a layering security system, preparation of a maritime transportation security plan, formation of maritime security advisory committees, establishment of maritime safety and security teams, and establishment of national transportation identification systems. The MTSA appropriated specified grant funding for security.

Since its inception, the U.S. Department of Homeland Security (DHS) administers security procedures at American ports and rail yards, employing the resources of the Transportation Security Administration (TSA), the U.S. Coast Guard, U.S. Customs and Border Protection (Customs), and the U.S. Citizenship and Immigration Service (Immigration) in conjunction with the Department of Transportation's Maritime Administration and Federal Railroad Administration. State and local law enforcement agencies retain their historical authority in ports. Railroad police officers, as authorized by Section 830.33 of the California Penal Code, enforce statutes and regulations on railroad property. Local harbor patrols and the California Department of Fish and Game assist the Coast Guard with enforcement of statutes and regulations and security within each California port, as appropriate. All interstate and foreign commerce is regulated by the appropriate federal agency.

Joint harbor operations or command centers, which include the Coast Guard, U.S. Navy, TSA, CBP, Federal Bureau of Investigation, port and/or harbor police, local law enforcement, California Department of Transportation, and California Highway Patrol personnel, oversee security in and around the ports. Each agency has defined roles and responsibilities. Port security includes various types of radar, sensors, and cameras. These centers possess the capability of electronically accessing driver history records, the Cal-Photo database,[2] wanted persons, probation, district attorney, and booking and court information databases. The U.S. Navy also employs swimmer detection sensors located near restricted areas.

Jurisdictional responsibilities within the ports are divided among multiple federal, state and local agencies as well as the private sector. Each port has a security strategy in which all agencies participate. These strategies may not always consider the impact on goods movement or the efficient movement of traffic. Enhancement of security strategies to consider the efficient movement of goods, while safeguarding California, has, and will continue to require, a coordinated approach. There are a number of long-term and short-term recommendations that should be considered to enhance port security and ensure a unified and standard approach to port security within California.

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[1] Public Law 107-295.

[2] Operated by the California Department of Justice, Cal-Photo permits law enforcement to use a Web-based solution to search and retrieve facial images from a statewide database that includes driver's license and police booking photos, as well as those of registered sex offenders.

B. Long-Term Action—Port Security Task Force

A steering committee, comprised of multiple working groups, consisting of members within the homeland security community should be established by the Governor to implement innovative security procedures and analyze current preventive capabilities at the ports. The California Office of Homeland Security should chair this task force.

Potential federal government stakeholders include DHS, TSA, FBI, Customs, Coast Guard and U.S. Secret Service. Potential state government stakeholders include CHP, Office of Homeland Security, the Office of Emergency Services, the Department of Fish and Game, and the California National Guard. Other stakeholders include railroad police, port associations and unions, local law enforcement and fire departments, local transportation authorities and steam ship companies.

The task force should establish working groups to include the teams listed below. These teams will work simultaneously with each other to expedite the final product:

- A Port Security Assessment Team to visit each California port and conduct security assessments, focusing on best practices, port-specific vulnerabilities, and security improvement needs.

- A Security Plan Development Team to consolidate information from the other teams, identify and document security needs applicable to all ports, and recommend priorities. This team will also contact ports outside California to determine what types of security improvements have been made globally.

- A Financial Research Team to identify and prepare grant requests, assess funding needs, and prioritize the distribution of funds. Funding sources that show high potential include the Urban Area Initiative and grant funding from TSA and DHS as well as traditional highway transportation funds.

- A Technology Research Team to identify applicable security technology to mitigate identified vulnerabilities at the ports. Existing security technology that could be implemented in the near term includes automatic vehicle identification systems,[3] radio frequency identification, global positioning satellites, and smartcards.

- An Intelligence Sharing Procedures Team to identify existing intelligence providers and determine protocols for sharing information.

- A Traffic Management Planning Team to create a traffic management strategy, which would ensure the efficient movement of goods entering, exiting, and within the port. The traffic management strategy would consider the need for security, while utilizing traffic routing, metering, and other advanced technologies to minimize congestion.

[3] For example, PrePass® is a type of automatic vehicle identification system that allows participating transponder equipped commercial vehicles to bypass designated weigh stations, port-of-entry facilities and agricultural interdiction facilities.

C. Short-Term Actions

The establishment of a task force with appropriate stakeholders will be time consuming. The following actions can be utilized to immediately improve the security of California ports.

1. Ships

   The Coast Guard has primary federal enforcement and security oversight of vessels operating in international waters and all U.S. controlled oceans, harbors, and navigable rivers and channels. Federal Customs or Immigration personnel screen sailors on cargo ships and screen sailors and passengers on cruise ships entering U.S. ports. Customs and U.S. Department of Energy personnel in foreign and U.S. ports inspect cargo, including inter-modal containers. Additionally, steamship companies have received federal grant funding to institute security procedures, approved by the Coast Guard, on their docks and ships. Under maritime law and tradition, a ship's captain possesses total responsibility and command of his or her vessel.

2. Port Operations

   The following internal actions could be taken to alleviate some of the safety/security risks in and around the ports:

   - Increased CTIP/FEAR Staffing: Provided grant funding could be identified, the Cargo Theft Interdiction Program (CTIP) and Foreign Export and Recovery (FEAR) Program could be increased to the State's three major ports for both inbound and outbound shipments. Additionally, all CTIP and FEAR personnel should be trained under Customs' Blue Shield Program, providing them the authority of a Customs officer.

   - Acquisition of Adaptable Radiation Area Monitors (ARAM): Provided grant funding could be identified, additional ARAM units could be deployed in and around the State's three major ports. ARAM units cost $150,000 per unit and can be produced at a rate of four to six units per month. ARAM units are designed to be permanent and stationary at CHP Commercial Vehicle Enforcement Facilities; however, they possibly could be modified into mobile units to be utilized in and around the port corridors.

   - Lighting/Camera Technology: Utilizing federal security grant funding, port authorities or terminal operators have expressed an interest to include or expand the utilization of improved lighting and security cameras to monitor the interior and exterior of the port facilities.

   - Intelligence: Joint harbor operations or command centers, the California State Warning Center (CSWC), and the Joint Terrorism Task Force (JTTF) should be freely sharing intelligence concerning security or possible importation of weapons

of mass destruction through the ports. In addition, information obtained by port authorities should be provided to the CSWC and the JTTF.

3. Trains/Depots

   - ARAMs: Provided grant funding could be identified, additional ARAM units could be deployed in and around the major rail corridors.

   - Lighting/Camera Technology: Utilizing federal security grant funding, railroad companies could include or expand the utilization of improved lighting and security cameras to monitor the interior and exterior of their rail yards.

4. Trucks/Highways

   - Deployment of CHP Mobile Road Enforcement Officers: Provided funding could be identified, additional CHP officers could be deployed in and around the ports and rail yards to provide a higher level of safety/security oversight. Since the ports are owned and operated by the harbor departments, CHP officers would have to be invited onto port property to conduct inspections.

   - Hazardous Materials Transportation: The CHP's motor carrier safety efforts could be focused on terminal inspections of hazardous materials companies doing business in the port as well as steamship companies owning container chassis. Grant funding could be pursued to increase the CHP's Motor Carrier Specialist I staffing.

   - Explosive Detection K-9s: Grant funding could be pursued to deploy additional K-9s in the major port corridors, including training for the dogs and handlers.

5. All Transportation Modes

   - National Transportation Worker Identification Credential: Truck drivers operating commercial motor vehicles in several harbors are currently required to possess a separate identification card for each location. These same drivers may also be required to possess a separate identification card for each rail yard and airport they enter. In August 2004, the Transportation Security Administration awarded a contract to BearingPoint, Inc. to develop a transportation worker identification credential (TWIC), which incorporates a biometric identifier, 64K contact integrated circuit chip, magnetic stripe, bar code, unique number and other security features. The TWIC will be a national identification card for drivers and workers in the transportation industry operating within the ports, eliminating redundant background checks and the requirement for a person to carry more than one credential. Each person applying for a TWIC is required to submit fingerprints and a criminal history check is completed before a TWIC is issued to the applicant. Credentials are currently being issued to drivers operating commercial motor vehicles in the Ports of Los Angeles and Long Beach,

employees within these locations, employees of several large shipping container companies, and employees at Los Angeles International Airport.

- Biometric Devices: Additionally, the U.S. Department of State is planning to adopt standards approved by the International Civil Aviation Organization, which selected facial biometrics as an identification tool for passports. Passports would utilize contactless chips that emit a low-power radio frequency eliminating the necessity of contact-reader devices. A 64K chip contains enough memory to store a biometric facial recognition photograph plus one or more biometric identifiers (e.g., fingerprints, whole hand prints, or retina prints). This type of biometric technology could be further utilized in sea/rail ports for enhanced security.

VIII. NEXT STEPS

A. Convene "Goods Movement 2" Stakeholder Session

On March 24, 2005, a follow up session will be held in Los Angeles to build upon earlier "listening conferences" held in Los Angeles on January 27-28, 2005 and February 11, 2005 in Oakland. At the March 24th meeting, the Phase I report of the Draft Goods Movement Action Plan will be presented. Public comments on the document will be taken in preparation for the development of the Phase II report. The Phase II effort will prioritize proposed goods movement infrastructure projects and environmental mitigation strategies.

B. Develop Action Plan Metrics

Phase II of the Goods Movement Action Plan will to formulate a fact-based, prioritized plan that follows the tenets of the Administration's goods movement policy position. The effort will entail development of evaluation criteria used to rank projects and an application of appropriate ranking methodologies.

1. Mission—Develop a formal statement of purpose that succinctly defines the policy developed by the Administration to improve and expand California's goods movement industry and infrastructure.

2. Outcomes—Formalize the policy outcomes and develop a series of strategies to accomplish the following:

    - Generate jobs
    - Increase mobility and relieve traffic congestion
    - Improve air quality and protect public health
    - Enhance public and port safety
    - Improve California's quality of life

3. Metrics—Develop detailed criteria that define performance achievement.

4. Benchmarks—Establish benchmarks to evaluate each strategy's performance towards the policy goals.

5. Best Practices—Develop a process of rating the outcomes using historical data for performance measures to measure improvements.

C. Develop Framework for Prioritization

The methods for prioritizing goods movement projects is a developing field that requires further analysis. The states of Washington, Pennsylvania, and New York, and regional

organizations such as the Chicago Area Transportation Study and the Puget Sound Regional Council, have various methodologies in place or under development. A federal research effort is currently underway to identify best practices for integrating goods movement project evaluation in state and local project selection and funding processes. The direction of many of these efforts, and those in California as well, is moving toward performance-based criteria, rather than descriptive criteria, in describing how the system in performing and how a project might alter the system's performance. This includes considering such factors as travel time and system reliability (i.e., variance in travel time), for interstate, inter-regional, and intra-regional trips.

In part, some of the factors that apply to passenger travel do not easily transfer to goods movement (e.g., average vehicle occupancy). There are also measures that are mode specific (average train travel speed). Some of the factors being discussed for project evaluation and prioritization includes the following:

- Total current average annual daily traffic
- Total current average five-axle truck traffic
- Total forecast average annual daily traffic
- Total forecast average five-axle truck traffic
- Percent current five-axle truck traffic to total traffic
- Percent forecast five-axle truck traffic to total traffic
- Level of service
- Total current daily peak train operations
- Total forecast daily peak train operations
- Global Gateways Development Program route
- Congestion/bottleneck relief
- Alternative travel corridor (i.e., alternate through or access route around a bottleneck)
- Access improvement to a restricted access area (e.g., northwestern coast of California)
- Access improvement to major freight facility (airport, seaport, rail yard, freight consolidation center, etc.) or border crossing
- Operations improvement (including use of intelligent transportation systems)
- Safety/security benefit

- System preservation/rehabilitation
- Environmental and community impact/mitigation
- Economic development impact
- Opportunity for public/private partnership
- Project benefit/cost

D. Identify Specific Finance Methods and Sources

A major factor that must be considered in the execution of infrastructure, environmental mitigation or homeland security projects is how the projects would be funded. While federal funding provides a significant share of overall project costs, private, public-private, and other innovative financing vehicles must be identified to augment limited federal funding relative to need. Each project will be reviewed to determine its potential for alternative funding mechanisms, potential to advance implementation, and prospects to attract additional private investment.

E. Prioritize Needed Actions and Project Sequencing

Another aspect that can help advance overall completion of critical projects is the prospects for innovative procurement methods such as design-build and design-sequencing. Such methods can result in quicker, less costly construction than when projects are developed using traditional methods. Taking a systematic, statewide view of proposed projects might help to identify alternative construction sequences that suggest project groupings more amenable to a wider range of alternative procurement options.

F. Institutionalize Statewide Process for Ongoing Coordination and Project Execution

The Goods Movement Action Plan is intended to help advance critical goods movement infrastructure, environmental mitigation, and homeland security projects by considering the disparate projects within each goods movement corridor as part of an integrated, statewide system. Developing methods to regularize the process can hopefully add value to build on the substantive work being done at the local and regional levels to improve the flow of goods, reduce its associated environmental impacts, and enhance the overall safety and security of the process.

IX. APPENDICES

A. ARB LIST OF EMISSION REDUCTION ACTIVITIES CURRENTLY UNDERWAY

B. GLOSSARY/ABBREVIATIONS

APPENDIX A

ARB LIST OF EMISSION REDUCTION ACTIVITIES CURRENTLY UNDERWAY

I. STATE LEVEL ACTIONS AND ACTIVITIES

A. Regulatory Efforts

Recent actions by the California Air Resources Board (ARB) that will result in near-term (pre-2010) benefits in and around ports, include cleaner fuel requirements for harbor craft and intrastate locomotives, the South Coast Locomotive memorandum of understanding, requirements to clean up transportation refrigeration units, and chip re-flash. Regulations under development and scheduled for ARB consideration in 2005 and 2006 that will further reduce emissions from goods movement, include:

1. In-Use Cargo Handling Equipment at Ports and Inter-Modal Rail Yards

Preliminary concepts for these regulations would require port equipment to accelerate turn over to 0.01 g/bhp-hr PM engines (for the yard trucks) or install best available control technology (i.e., highest level of emission control equipment verified). As currently envisioned, these regulations could realize about a 40 to 80 percent reduction in emissions from the in-use fleet by 2010.

2. In-Use Harbor Craft

Preliminary concepts for these regulations would require the in-use fleet to meet U.S. EPA 2004 marine engine standards through the use of retrofits, engine re-powering or rebuild kits. Compliance dates would be based on the age of the engine and the hours of operation with the older engines, with high annual operating hour engines needing to come into compliance first. As currently envisioned, these regulations are targeting about a 25 percent reduction in diesel particulate matter and nitrogen oxide (NOx) emissions.

3. Requirement for Ocean Going Ships to use Cleaner Fuels in Auxiliary Engines while in California Coastal Waters and at Dock

This proposal, first released in February 2004, would require the use of distillate marine fuels (i.e., low sulfur marine gas oil) in ship auxiliary engines while operating in California coastal waters and at dock. These fuels would result in an estimated six to ten percent reduction in NOx and 63 percent diesel PM reduction typical to heavy fuel oils, which are increasingly used in these engines.

4. In-Use Emission Controls for On-Road Heavy-Duty Trucks

This measure would require public and private on-road truck operators to reduce emissions from their truck fleets. The strategies that operators select must have ARB-verified emission reductions or involve the use of ARB-certified engines.

B. Other Control Efforts

1. Use of Lower Sulfur Bunker Fuels

ARB staff is evaluating the feasibility of requiring the use of cleaner bunker fuels in ship engines. One avenue is to encourage the U.S. Environmental Protection Agency (U.S. EPA) to request the establishment of a Sulfur Emission Control Area (SECA) wherein ships would be required to use lower sulfur (1.5 percent) fuel. ARB staff estimates the use of lower sulfur bunker fuel will provide about an 18 percent reduction in diesel PM emissions. MARPOL Annex VI is the international treaty that sets forth legally binding international standards concerning air emissions from ships. Annex VI enters into force in May 2005. Annex VI contains a provision that allows one or more countries to propose an area as a SECA. In the United States, the treaty was submitted to the Senate Foreign Relations Committee on May 15, 2003. However, the U.S. Senate has not yet ratified the treaty. U.S. EPA staff is beginning to explore the feasibility of requesting a SECA designation for the United States. ARB staff is working closely with U.S. EPA staff on this effort as well as with other sister agencies in Oregon, Washington, and Canada to begin compiling the necessary documentation to request designation. ARB staff is also evaluating other options to pursue in the event the SECA is not approved.

2. Enhanced Port and Locomotive Emission Reduction Plan

The Governor has asked the California Environmental Protection Agency to develop an innovative program building on the regulatory program already mapped out by ARB to identify financial and regulatory incentives to further reduce air pollution at the ports. A key element of this plan would be to urge the federal government to provide the necessary incentives and regulations that would result in early reduction of pollution at ports and related goods movement activities. ARB staff is beginning the technical work to design the strategy, hoping to have a strategy mapped out within four to six months. ARB envisions that the statewide strategy will identify and prioritize measures for trucks, trains, ships, cargo-handling equipment, and harbor craft, taking into consideration impacts of toxics exposure and regional and community air pollution concerns.

3. Ship Memorandum of Understanding

ARB staff is exploring a memorandum of understanding with the major shipping lines that dock at California ports. The agreement would specify emission reduction measures to achieve desired reductions yet give individual carriers flexibility in how they are achieved. Examples of possible measures are: using lower sulfur bunker fuel or distillate fuels in main engines while in California coastal waters, routing the cleanest ships to California, and building new ships with cleaner engines.

4. Rail Memorandum of Understanding

Discussions are under way on a new rail memorandum of understanding that would complement the existing South Coast agreement. Rail interests have indicated a willingness to consider both near- and long-term elements. Possible near-term elements include: use of ARB diesel, idling restrictions, smoke inspections for locomotives, cleaner engines for the captive fleet, installation of automatic idling shut off devices.

5. Incentive Funding

Under the FY2004-2005 funding for the Carl Moyer Program, ten percent has been set aside for multi-district projects having statewide priority. Solicitation for projects targets goods movement activities, including maritime port and rail yard applications, such as marine vessels, locomotives, off-road equipment, and on-road vehicles.

C. Investigative Efforts

1. Shore Power Feasibility Study

In December 2004, ARB staff initiated a shore power (i.e., cold-ironing) feasibility study. The purpose of the study was to assess the technical feasibility of the use of shore power at California ports for ocean-going ship hotelling needs and to determine at which ports shore power is feasible and cost effective. The study will also provide a recommendation on the viability of using shore power as an emission control strategy when developing statewide regulations to reduce air toxic and criteria pollutant emissions.

2. Southern California Children's Environmental Risk Reduction Plan

The focus of the plan is to reduce diesel PM emissions and other toxics from mobile and stationary sources at the neighborhood level in areas such as Wilmington, Mira Loma, and Commerce. Projects will be conducted in all three communities. Proposals include programs to identify and remedy excessive smoke from trucks and locomotives, pollution prevention programs, a pilot inter-modal rail emission reduction program, and exploring new technologies in emission control equipment for stainless steel welding and chrome plating.

3. Rail Yard Risk Evaluations

In October 2004, ARB staff released the Roseville Rail Yard Study. In this study, ARB conducted a health-risk assessment of diesel PM emissions from diesel locomotives at the Union Pacific J.R. Davis Yard located in Roseville, California. The results of the exposure study show elevated concentrations of diesel PM and associated cancer risk impact a large area. Risk levels between 100 and 500 in a million occur over about 700 to 1,600 acres. Given the magnitude of diesel PM emissions and the large area impacted, other rail yards, such as those at Barstow, Colton, and Commerce are now being studied.

II. PORT AND LOCAL ACTIONS

A. Emission Reduction Programs Undertaken by Ports

1. Port of Los Angeles

In response to Mayor James Hahn's directives, the Port of Los Angeles Board of Harbor Commissioners, on October 10, 2001, announced a new environmental policy "that there will be no net increase in air emissions or traffic impact from future port operations." The port also formed a Port Community Advisory Committee that began meeting on January 17, 2002. The purpose of committee is to assess the impact of port development on harbor-area communities and to recommend suitable mitigation measures to the Board of Harbor Commissioners, to review past, present, and future environmental impact reports, and to provide a public forum to assist the port in taking a leadership role in creating balanced communities in the harbor area.

Over the past five years, the Port of Los Angeles has undertaken several initiatives to reduce air pollutant emissions, including the installation of diesel oxidation catalysts on yard tractors and the use of emulsified fuel, accelerated turn-over of yard equipment, cold-ironing of ships while at dock, use of cleaner fuels in port equipment, investment in inter-modal rail facilities to allow for the direct transfer of containers to and from ships and trains, and plugging tugs into electrical power as they idle at the docks prior to the next assist. Recently, Mayor Hahn convened a "No Net Increase Taskforce" that is charged with identifying measures that need to be implemented to demonstrate no net increase of emissions from the 2001 emissions baseline. ARB is a member of the task force, which expects to release a draft plan in late March.

2. Port of Oakland

In 2000, the Port of Oakland released the Vision 2000 Maritime Development Program comprising the expansion plan for the port including new marine terminals, roadways, a rail yard park, and associated facilities. An Air Quality Mitigation Program was also put in place to mitigate potential air quality impacts of the expansion. The program calls for emission reductions from many terminal air pollution sources such as aqueous diesel fuels for transport trucks, tugboat re-powering, local transit bus re-powering, truck/cargo equipment re-powering and retrofits.

3. Port of Long Beach

The Port of Long Beach has taken the initiative to install new technology in port-owned vehicles, terminal equipment, and locomotives. Other Port of Long Beach projects include evaluating the feasibility of liquefied natural gas or liquefied petroleum gas in heavy-duty terminal equipment, completing a "Cold Ironing Feasibility Study" (in 2006 BP hopes to have Berth T121 converted to cold-iron two tankers), enclosing petroleum coke dust piles, supporting the Gateway Cities Clean Air Program, and assisting tenants

in the use of alternative diesel fuel and the installation of pollution control devices on yard trucks.

B. Gateway Cities

The Gateway Cities Clean Air Program provides financial incentives to reduce diesel pollution in Southern California. The Gateway Cities program includes funding from ARB, U.S. EPA, Mobile Source Air Pollution Reduction Review Committee, and the Port of Los Angeles. As of December 2004, the Gateway Cities Clean Air Program has spent approximately $6.2 million to decrease emissions in 245 commercial trucks.

APPENDIX B

GLOSSARY/ABBREVIATIONS

ARAM	Adaptable radiation area monitors
ARB	California Air Resources Board
BNSF	Burlington Northern Santa Fe Railroad
CalEPA	California Environmental Protection Agency
Caltrans	California Department of Transportation
CHP	California Highway Patrol
CIRIS	California Inter-Regional Intermodal System
CSWC	California State Warning Center
CTIP	Cargo Theft Interdiction Program
DHS	U.S. Department of Homeland Security
FBI	Federal Bureau of Investigation
FEAR	Foreign Export and Recovery program
JTTF	Joint Terrorism Task Force
HOV	High Occupancy Vehicle
MTSA	Maritime Transportation Security Act of 2002
NAFTA	North American Free Trade Agreement
NOx	Nitrogen oxides
PM	Particulate matter
POE	Port of entry
SCR	Selective catalytic reduction
SR	State Route
TEU	Twenty-foot equivalent unit
TSA	Transportation Security Administration
TWIC	Transportation worker identification credential
SCAG	Southern California Association of Governments
SECA	Sulfur emission control area
Throughput	Total amount of freight imported or exported through a port as measured in tons or TEUs
UP	Union Pacific Railroad
U.S. EPA	U.S. Environmental Protection Agency

County Designations:

ALA	Alameda
CC	Contra Costa
FRE	Fresno
HUM	Humboldt
IMP	Imperial
KER	Kern
KIN	King
LA	Los Angeles
MAD	Madera
MEN	Mendocino
MER	Merced

MON	Monterey
NEV	Nevada
ORA	Orange
PLA	Placer
RIV	Riverside
SAC	Sacramento
SBD	San Bernardino
SCL	Santa Clara
SCR	Santa Cruz
SD	San Diego
SJ	San Joaquin
SHA	Shasta
SLO	San Luis Obispo
STA	Stanislaus
SOL	Solano
TEH	Tehama
TRI	Trinity
TUL	Tulare
YOL	Yolo